VOLUME XLIII NUMBER TWO

THE NATIONAL GEOGRAPHIC MAGAZINE

FEBRUARY, 1923

CONTENTS

SPECIAL SUPPLEMENT:
PANORAMA OF THE GREAT WALL OF CHINA
(Size, 45½ x 9½ inches)

A Thousand Miles Along the Great Wall of China
With 30 Illustrations — ADAM WARWICK

The Battle-Line of Languages in Western Europe
With 36 Illustrations — A. L. GUERARD

Daily Life in Calabria
16 Illustrations in Duotone

Encircling Navajo Mountain with a Pack-Train
With 34 Illustrations — CHARLES L. BERNHEIMER

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TO carry out the purposes for which it was founded thirty-four years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resultant given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization which was waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the historic expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members through The Society to the Federal Government when the congressional appropriation for the purchase was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people and incorporated into a National Park.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings whose ruins are ranked second to none of ancient times in point of architecture, and whose customs, ceremonies and name have been engulfed in an oblivion more complete than any other people who left traces comparable to theirs.

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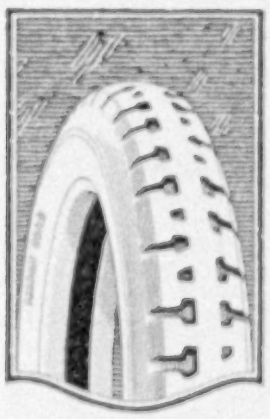

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Miss Keller has attained international fame for her mastery of handicaps. Though blind, deaf, and dumb, she now "sees" and "hears" through touch. She converses fluently. She has devoted her life to the helping of others similarly afflicted.

Miss Keller touring in the Catskills
—A painting by the Countess Elizabeth Zichy

"I knew we were in the Catskills by the atmosphere"

By Helen Keller

"I am delighted with my Marmon. To my touch the workmanship seems perfect.

"Borne along on deep, springy cushions, I find a long drive in it lulling and alluring. I do not have to hold on to keep my balance. In other cars I am keenly conscious of curves, but in my Marmon I hardly know when we turn a sharp corner.

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"I can hardly say enough in praise of this wonderful automobile. It gives me so much enjoyment."

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The
Essence of Modern Business

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CLOSE figuring on Time is so much a matter of course these days that it is hard to realize what life would be without it.

The business man takes it for granted that his mail will be on his desk every morning.

He looks at a railroad time table—telegraphs an appointment half way across the Continent—and keeps it to the dot.

And it all depends on *uniform time-keeping* by the more than 400,000 Railroad Watches in the pockets of the responsible railroad men of America.

Perfecting the watch of today has engaged many scientific minds. To mention any one Company might seem invidious.

But the peculiar *pride* of the Railroad Man in his *Elgin Watch* is worthy of remark.

All the more so, since this pride is shared by other Elgin Watch owners, in all walks and occupations of life.

* * * *

*"Father Time"—one of Elgin's popular Railroad movements, here shown cased up with Winding Indicator Dial. * * * Twenty-one jewels; adjusted to temperature, isochronism and five positions. Material, construction, adjustments and service fully covered by Elgin Guarantee * * Made in Elgin, U. S. A.*

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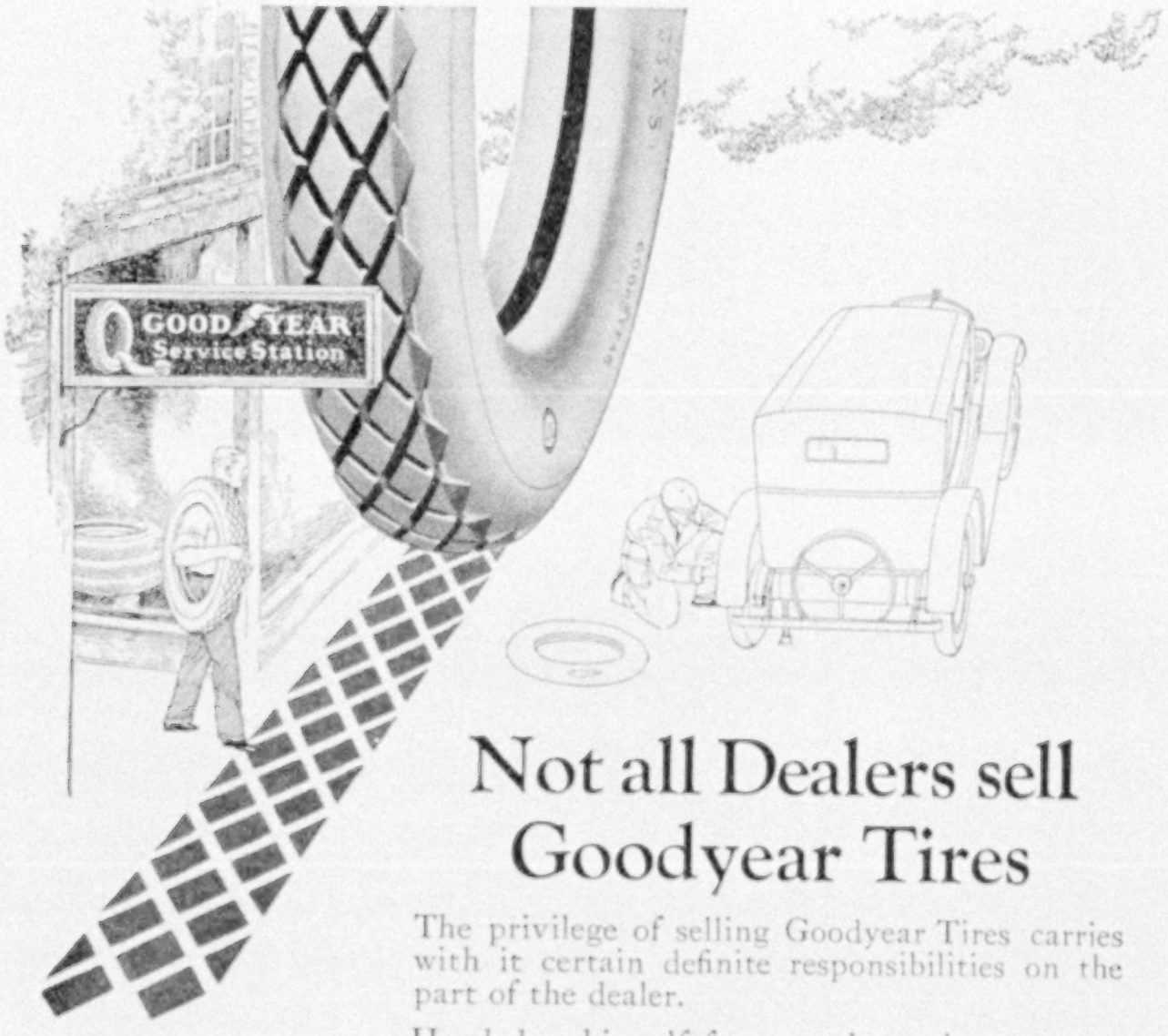

Seek out the Goodyear Service Station Dealer near you. He sells and recommends Goodyear Tires and backs them up with standard Goodyear Service

Not all Dealers sell Goodyear Tires

The privilege of selling Goodyear Tires carries with it certain definite responsibilities on the part of the dealer.

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He prefers to sell Goodyear Tires because he knows he can sell them to more people, and thus be compensated for lower profits on each sale.

Not all dealers see the wisdom of doing business on this basis; consequently not all dealers sell Goodyear Tires.

But Goodyear Dealers implicitly believe, as we do, that the foundation of a permanent and successful business is satisfied customers.

Dealing with them, you are sure of a quality product of exceptional and demonstrated value, supported by a service that will save you money.

Goodyear Means Good Wear

GOODYEAR

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Examine this keyboard carefully. Key for key, you will find it an exact duplicate of the keyboard on the big typewriters. Nothing new to learn, and nothing to unlearn when you start to write on the

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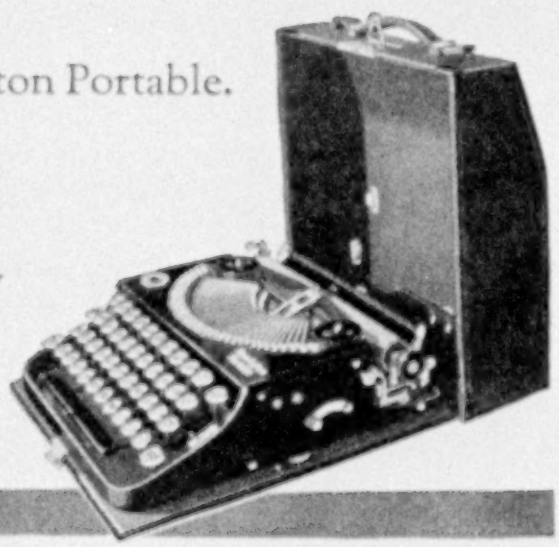

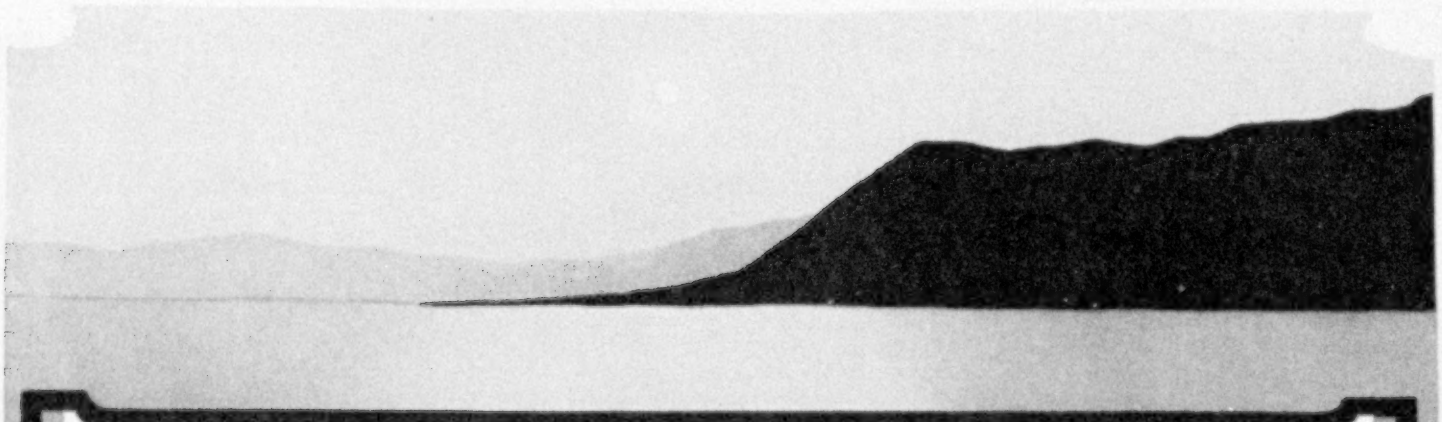

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Including Iceland and the "Midnight Sun"

(3rd Raymond-Whitcomb North Cape Cruise)

The exceedingly gratifying success of last year's Raymond-Whitcomb North Cape Cruise prompts us to announce another equally alluring Cruise to this individual field for *comfortable Summer travel.* The inclusion of Gothenburg with its brilliant Tercentennial Exposition is an additional attraction on this year's trip

The 1923 Cruise sails from New York, June 23 on the well known Royal Mail S.S. "Arabuaya". The varied program includes Iceland, the great North Cape, the beautiful Norwegian Fjords, Trondhjem, Bergen, Copenhagen. In fact, all the principal and worth-while points of interest in picturesque and unique Northern Europe. The increasing popularity of this Summer Travel Event makes early reservations desirable. Booklet, rates and ship's plan may be had upon request

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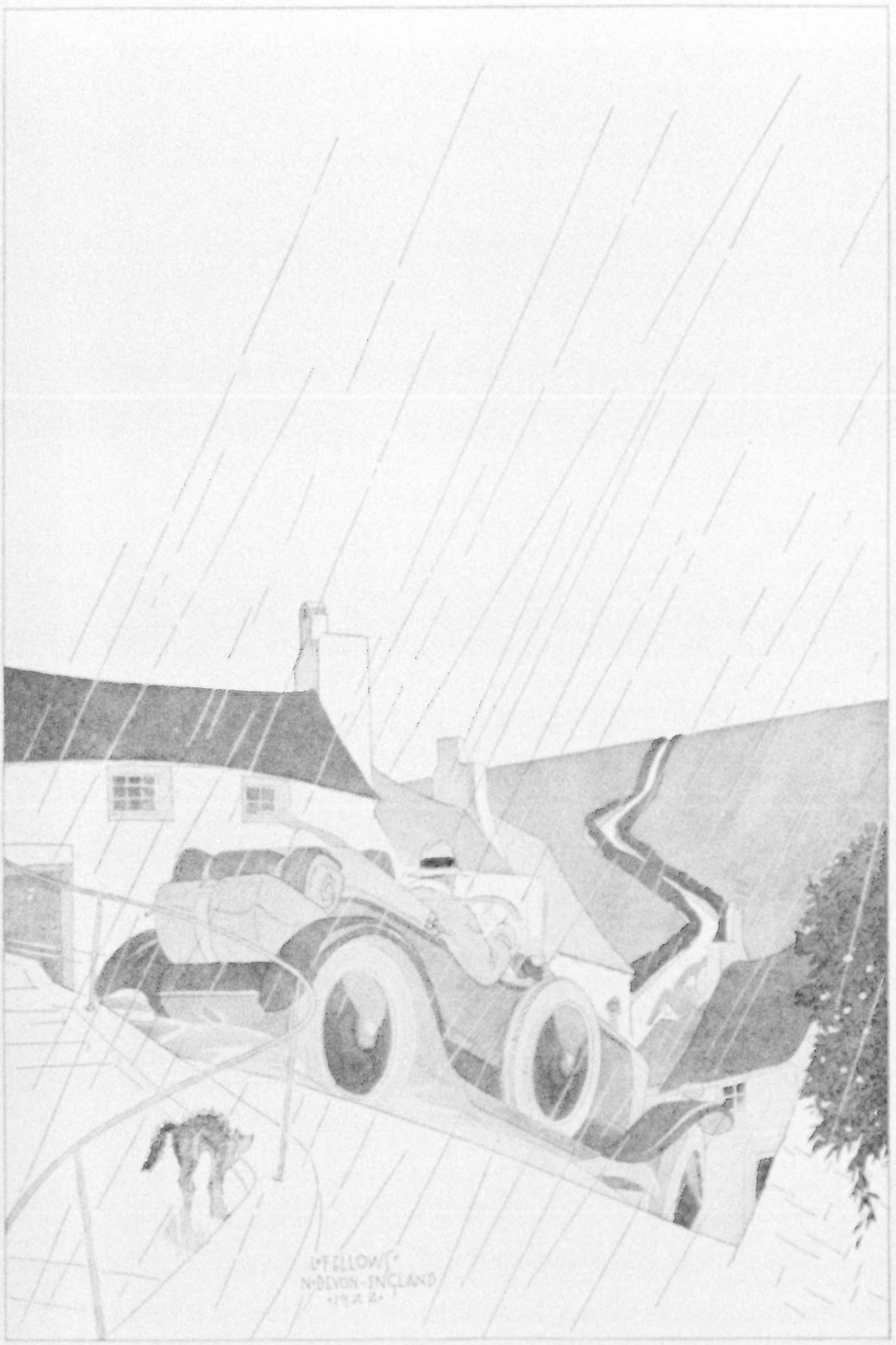
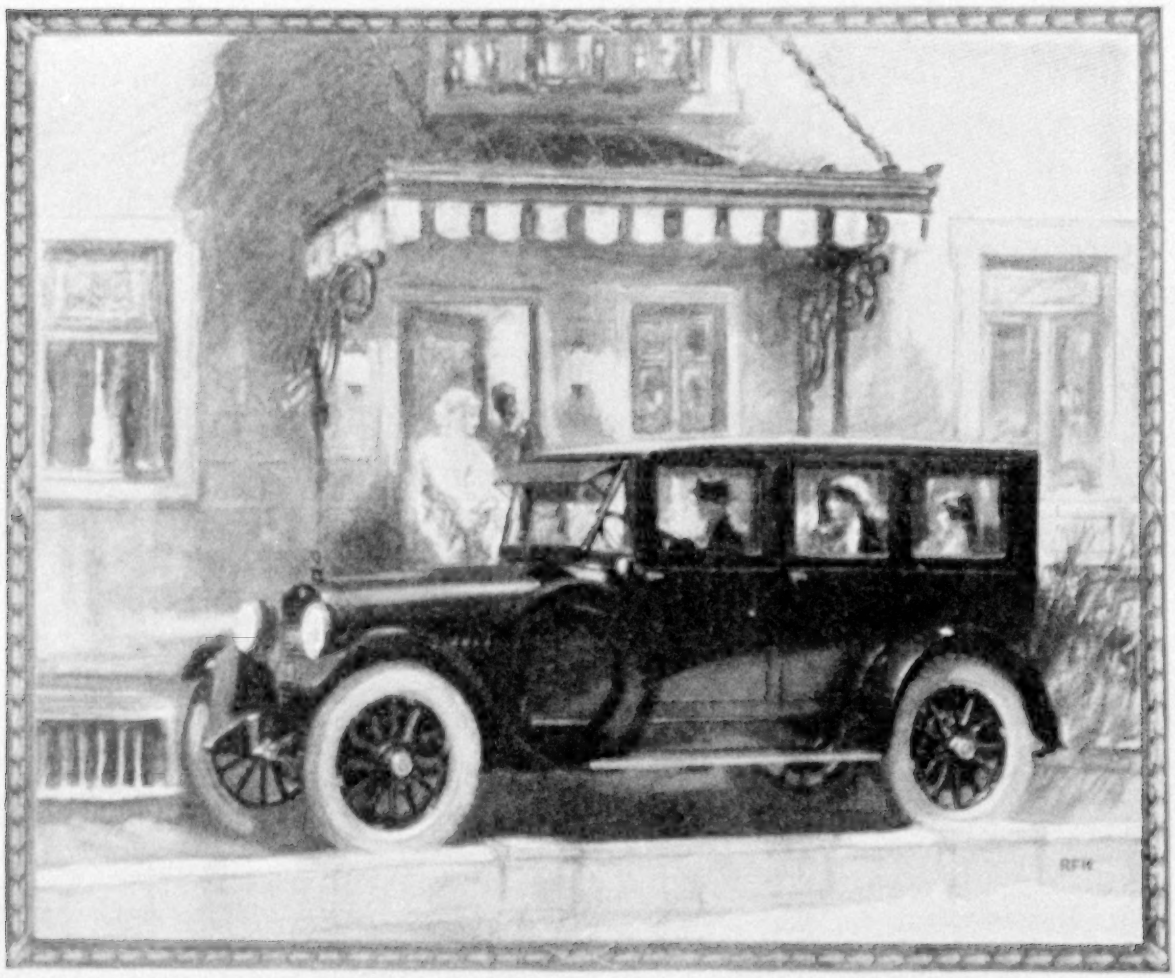


PARRACOMBE HILL *

"Oh, Larry, do you think we can get down this wet hill without a smash?"
"Of course we can, dear; I've put her in second, and with Kelly Cords under us we can't slip."

THERE is no more sickening sensation than to feel your car sliding after you have applied the brakes. The driver who rides on Kelly-Springfield Kant-Slip Cord tires does so with the comfortable assurance that he can depend not only upon their mileage but upon their surefootedness. It costs *no more* to buy a Kelly.

*Drawing by Laurence Fellows, Devonshire, England.



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For Those Who Want The Finest 7-Passenger Closed Car

Particular attention is called to the price of the Hudson Sedan—$2095—for two reasons.

We offer the Sedan as the very finest closed car that can be built. It is the product of one of America's oldest builders of costly bodies. The workmen have never been hurried. Painstaking care is expressed in every detail. Quantity production, as understood in motor car building, is not possible with such traditions and organization. But the costly though worth-while way of manufacture under such conditions has been greatly minimized by the fact that the entire effort of this builder is exclusively devoted to the Hudson Sedan. Thus we obtain the richness and fineness of the most exclusive custom built bodies and at the cost of quantity output.

No car at its price that has a body of approachable attractions in richness and luxury is so well regarded for performance and reliability. For you know the Hudson Super-Six, by official mark, is one of the world's truly great motor cars. And with the new improved Super-Six motor it is a smoother, more enduring car than the 120,000 earlier models which during the past seven years gave it such wide fame.

And where you find a car of comparable appeal in body and in automobile performance you will also find the cost is from $1,000 to $1,500 greater than for the Hudson Super-Six, seven-passenger Sedan.

Speedster - $1425 7-Pass. Phaeton - $1475 Coach - $1525 Sedan - $2095

Freight From Detroit and Tax Extra

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The Famous Super-Six

Are you the Lucky *One in Five?*

Not if you neglect your teeth

All too few persons practice the strictest oral hygiene. Far too many are infected with Pyorrhea, and through neglect, lose their teeth and suffer from broken health. For statistics show that four out of every five past forty, and thousands younger, are subject to this disease.

At the first sign of Pyorrhea, Nature gives her danger signal—tender gums which bleed easily when the teeth are brushed.

Fortunate is he who heeds that friendly warning; his teeth may be spared, while he who neglects that admonition may pay the extreme penalty.

Heed Nature's Warning

At the first sign of tender, bleeding gums, go to your dentist for teeth and gum inspection and start using Forhan's For the Gums at once.

Forhan's For the Gums is the scientific formula of R. J. Forhan, D. D. S. If used consistently and used in time, it will prevent Pyorrhea or check its course.

In addition to its efficacy in the treatment of Pyorrhea, Forhan's For the Gums is an excellent dentifrice. It contains nothing but the most beneficial ingredients that keep teeth white and clean, and the gums firm and healthy.

Remember, statistics are all against you. Science proves that four out of every five have Pyorrhea after forty. For that reason it is good health insurance to start using Forhan's For the Gums today. It is pleasant to the taste.

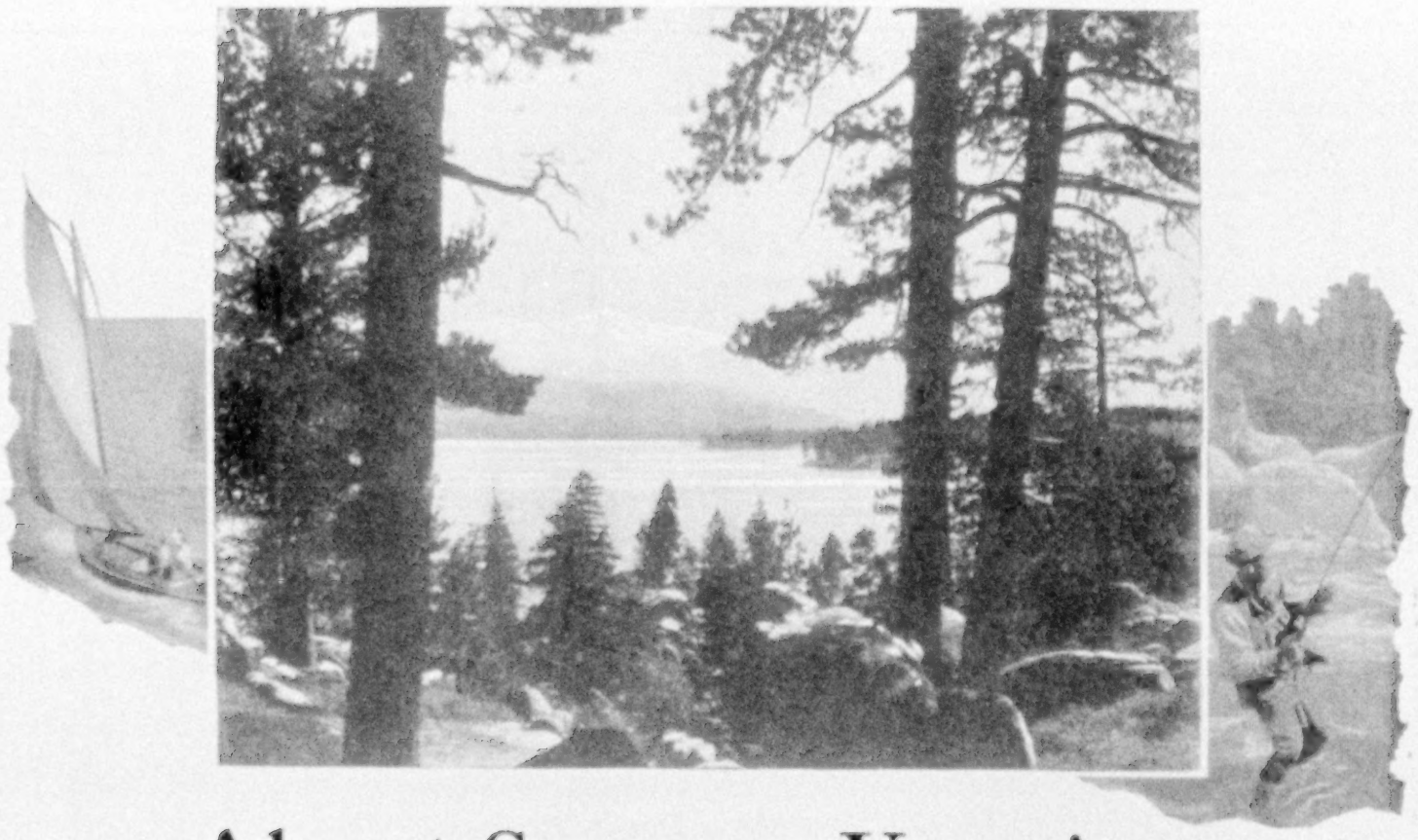
Forhan's For the Gums is sold by druggists everywhere. 35c and 60c.

Forhan's

FOR THE GUMS

More than a tooth paste — it checks Pyorrhea

Formula of R. J. Forhan, D. D. S.
Forhan Company, New York
Forhan's, Limited, Montreal



About Summer Vacations

BY A PHYSICIAN

MY business is to know something about *people* as well as medicine. My practice is in a large eastern city where men work hard and women do, too; for housekeeping is hard work whether the woman does it herself or has a coterie of servants to manage.

Every year, about the end of May, I am called in by many people who say they are run down and need a tonic. Perhaps I give them a little tonic, but I give most of them more advice than tonic.

That advice is, "Take a good vacation this summer—get a real change, the greater the change the better—have you ever been to Southern California?"

"Well, but you don't mean to go there *in the summer*, doctor—it's so *warm* there"—this from people who have never been there.

The fact is, it is *cool* there in summer, and this is shown very clearly by these U. S. Weather Bureau Figures — averages from 44 years' readings in a great central city of that section:

Average mean temperature, 44 Junes	66°
Average mean temperature, 44 Julys	70°
Average mean temperature, 44 Augusts	71°
Average mean temperature, 44 Septembers	69°

Then I emphasize—because this is the *great value* in it—the absolute, complete and fascinating *change* that they will find there to absorb them and remake them into freshened, newly interested human beings.

And then, to lure them on, I tell them these things, which are facts:

There's a "little trip abroad within your own United States" awaiting you this summer if you make this trip. Practically every type of scenery that the world affords within a radius of only a few hundred miles from the great central city mentioned before.

And nearly all points reached by more than 4,000 miles of paved motor roads or by trolley or train.

A great desert like Sahara, rich wheat fields, groves of oranges and figs, old missions, palm-lined ocean beaches, snow-capped mountains, western "cowboy" plains, mining towns, enormous redwood forests, great waterfalls and cliffs, ocean islands like Capri in Italy—the imposing landscapes, sea views and the variety that caused 160 moving picture producing companies to locate there—are there also for you to profit by.

Golf at its best—scores of famous courses. Swimming, sailing, fishing, horseback riding, hiking, dancing in fine hotels, or merely lazy rest in some mountain retreat. All these attractions are within your reach.

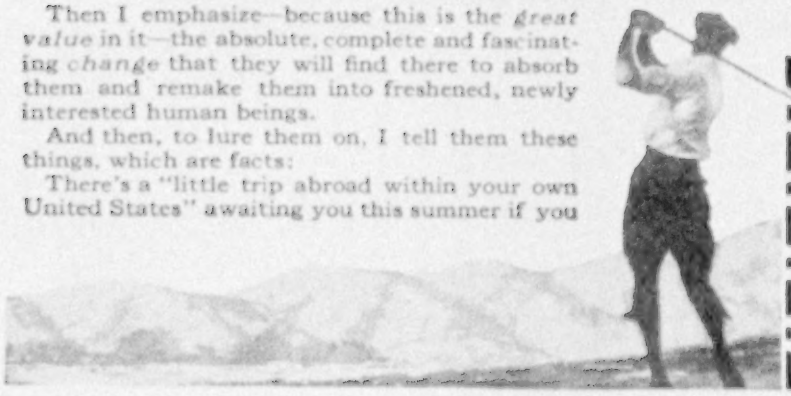
But best of all, a marvelous outdoors and a fine, pure air that children, especially, thrive on.

These are the things I tell them—for their own benefit and fun. Several have told me that this is the best kind of "medical advice" they ever had.

Perhaps it is in your case if you work hard through the year.

If you are interested in this physician's story and would like more information about Southern California as a summer playground, ask any railroad ticket agent, *or mail coupon below*. There are far greater possibilities than one small page can relate. Mail coupon now.

All-Year Club of Southern California



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Please send me full information about the summer and year around vacation possibilities in Southern California.

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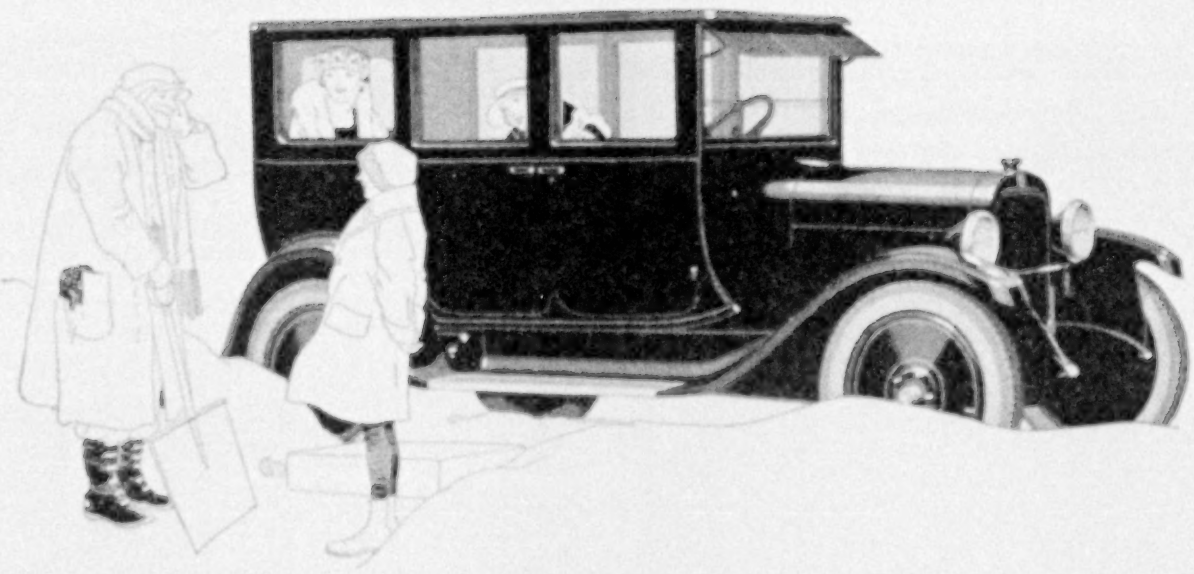
Dodge Brothers "Type A" Sedan is admired the world over for the solid beauty of its coach work.

Inside and out, in every line and fixture, it reflects that integrity of workmanship which you have come to associate with the name Dodge Brothers.

Mohair velvet upholstery, nickeled window regulators, etched dome light, heater, windshield wiper, sun visor, weather-stripped doors and windows, cord tires and steel disc wheels, are a few points of equipment which indicate the sterling quality of the car throughout.

The price of the "Type A" Sedan is $1440 f.o.b. Detroit



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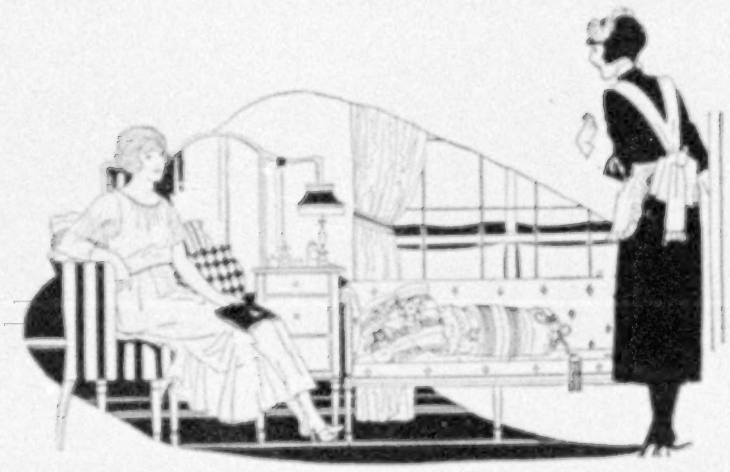

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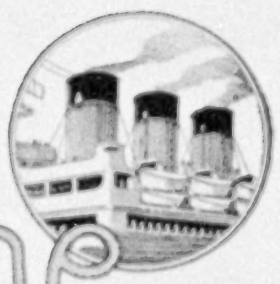

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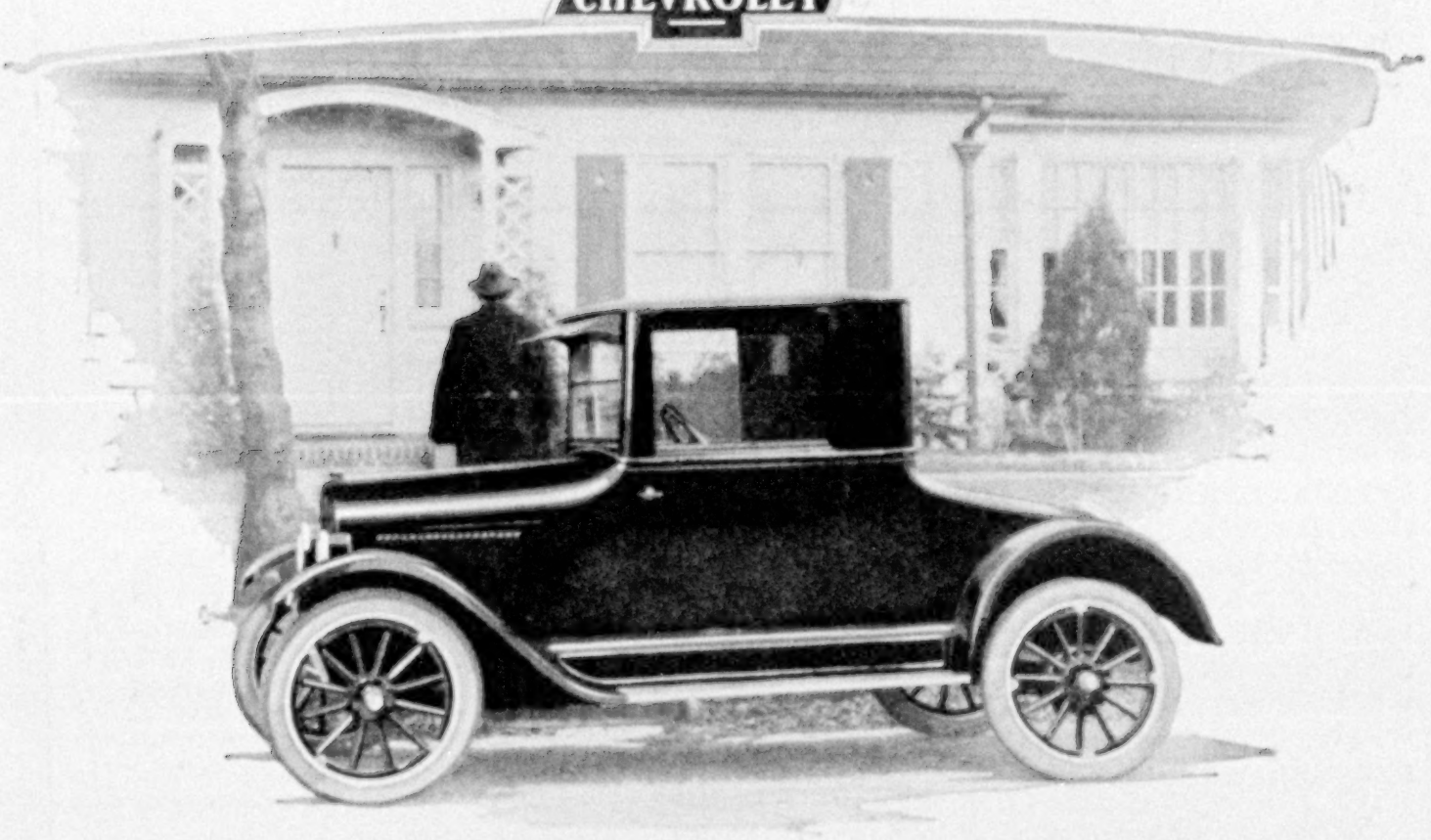

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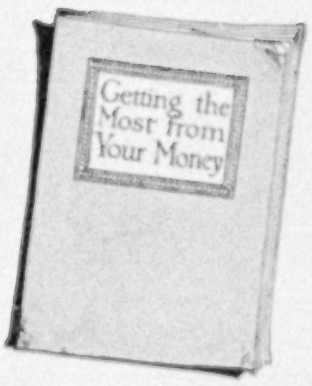

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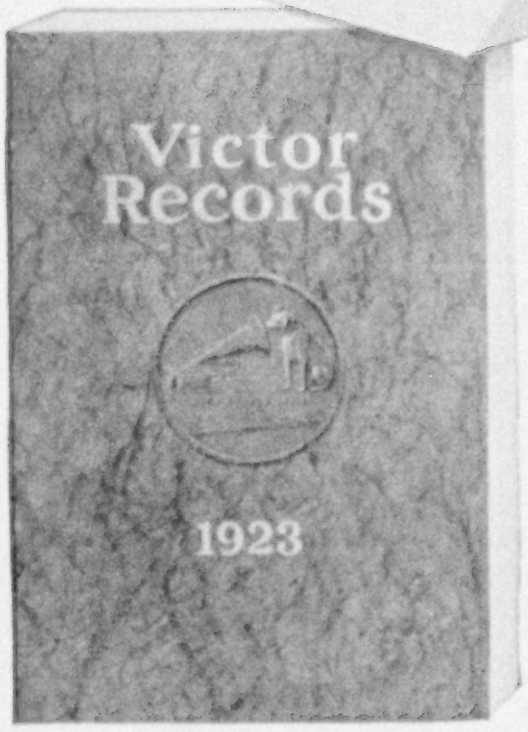

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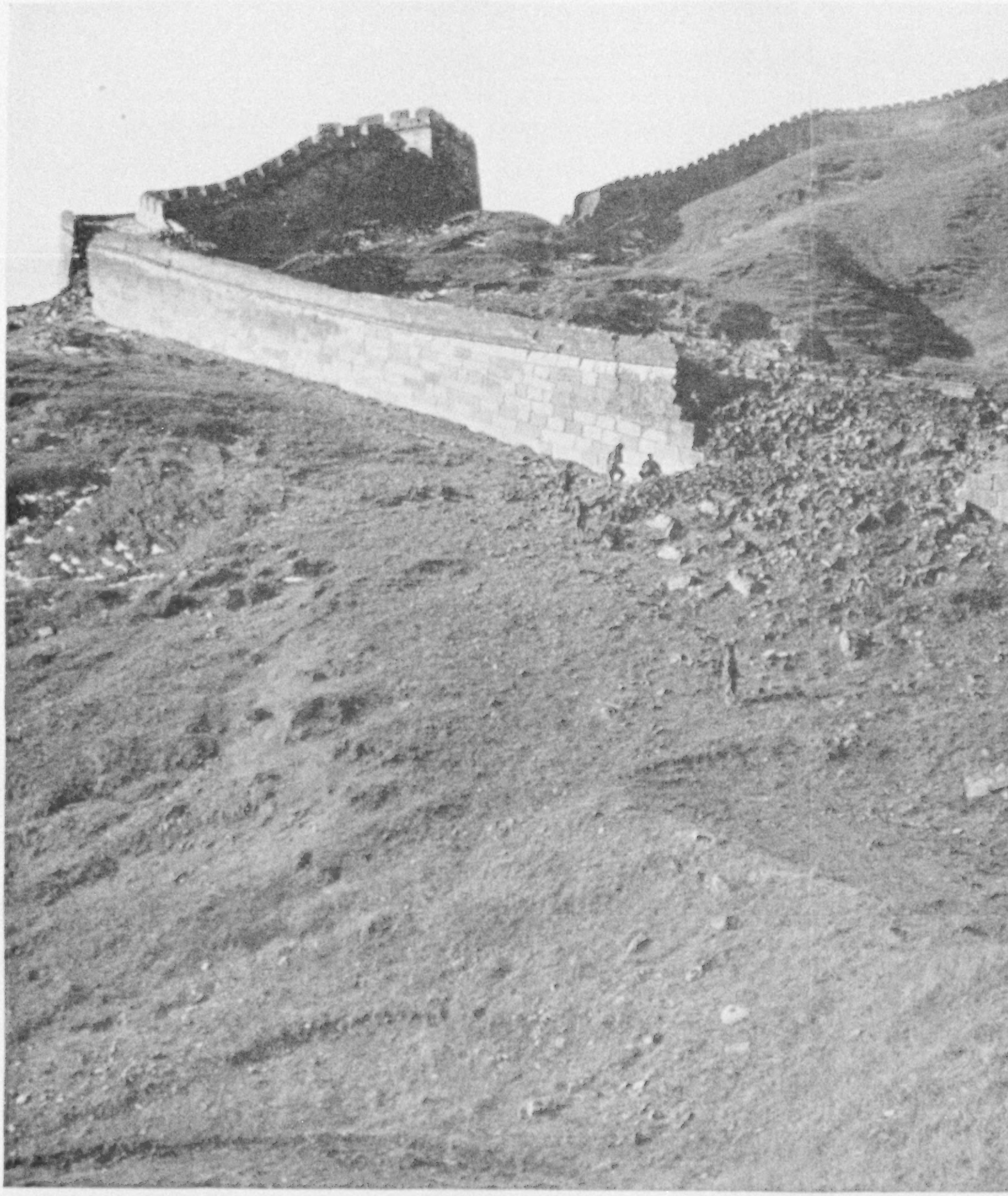

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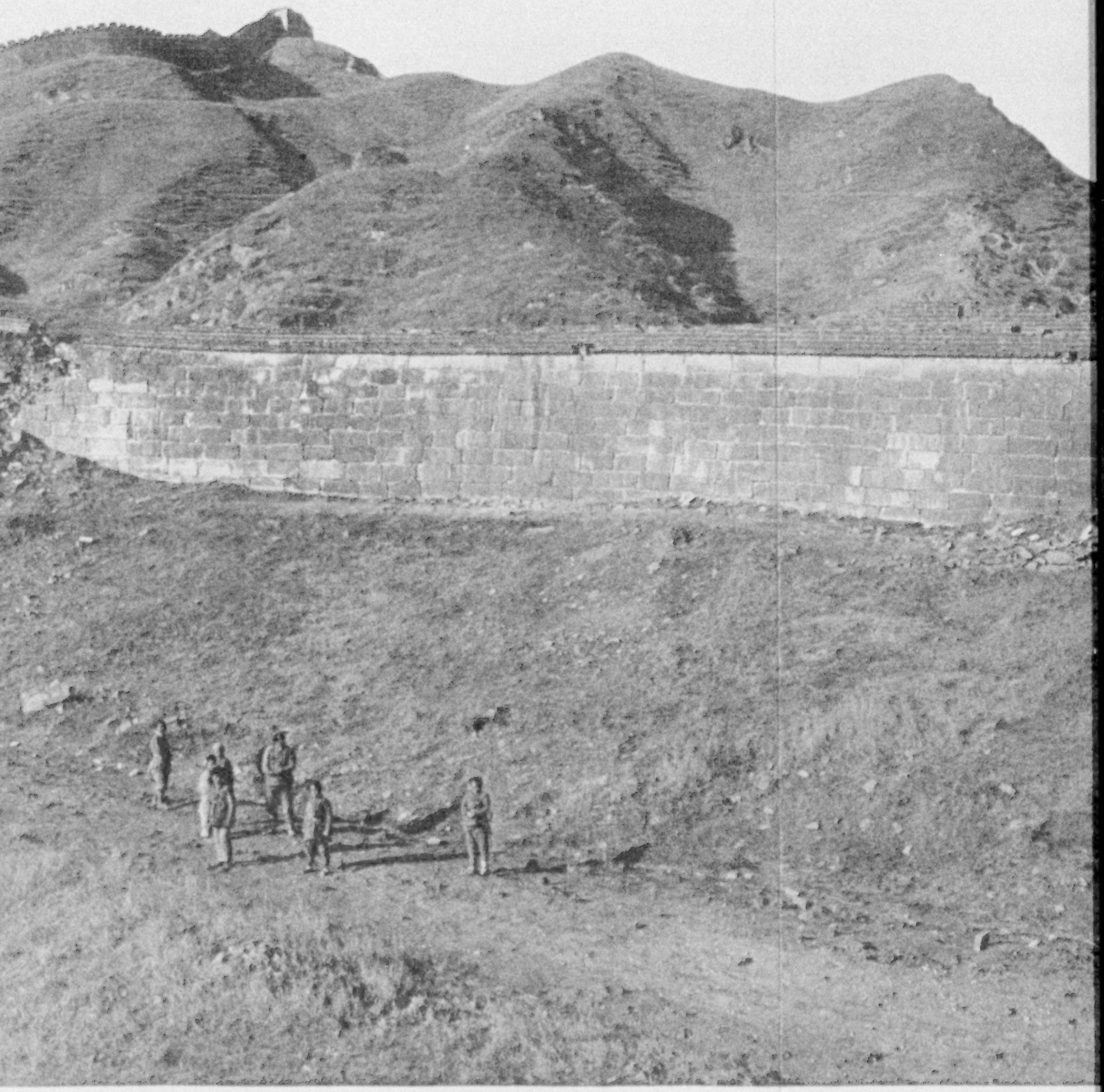

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THE GREAT WALL OF CHINA NEAR NANKOW PAS

For more than two thousand miles this Long Rampart, the most stupendous structure ever raise
of man, writhes along the mountain peaks, dips deep into valley and canyon, and pursues its des
wind-swept plateau and desert sands. Its myriad cloud-capped towers "stand in solemn stillness,
stationed twenty centuries ago, as though condemned to wait the march of Time until their

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NANKOW PASS

ndous structure ever raised by the hand
nyon, and pursues its desolate way across
and in solemn stillness, where they were
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VOL. XLIII, No. 2 WASHINGTON FEBRUARY, 1923

THE NATIONAL GEOGRAPHIC MAGAZINE

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A THOUSAND MILES ALONG THE GREAT WALL OF CHINA

The Mightiest Barrier Ever Built by Man Has Stood Guard Over the Land of Chin for Twenty Centuries

BY ADAM WARWICK

AUTHOR OF "THE MONGOLS, PEOPLE OF THE WILDERNESS," IN THE NATIONAL GEOGRAPHIC MAGAZINE

ACCORDING to astronomers, the only work of man's hands which would be visible to the human eye from the moon is the Great Wall of China.

Some idea of the size of this stupendous construction may be gained from the calculation that if the materials of which it was built were used to encircle the globe at the Equator, they would be sufficient to form a barrier eight feet high and three feet thick. A member of Lord Macartney's Embassy in 1790 estimated that there were more brick and stone in the Great Wall than in all the buildings in the United Kingdom.

Historians class this mighty rampart as the "Eighth Wonder of the World"; and not the least wonderful part about it is that it has survived all the others save one, the Great Pyramid of Kufu at Gizeh.

The Hanging Gardens of Babylon are only a memory. The Tomb of Mausolus, conception of a devoted wife, has left but a name. A few columns embodied in the central aisle of St. Sophia are all that remain of the magnificent Temple of Diana at Ephesus. The Jupiter Olympus of Phidias has disappeared. The watch-tower lighthouse of Pharos was defeated in its battle with Time after a struggle of 1,500 years, and the brass Colossus of Rhodes, overturned by an earthquake, was ignominiously carried away piece by piece into the desert by pilfering Arabs.

The Great Wall of China differed from the other famous works of antiquity in that it served a utilitarian purpose, whereas they (except the Pharos) were all "preposterous edifices of exaggerated hugeness, of dazzling and ruinous luxury." It had a mighty purpose, serving as a barrier to keep the barbarians of the north from overrunning China, whose fertile plains invited them.

The idea was not ridiculous, in an era when bows and arrows and twisted pikes were the weapons of invaders. Then earth and stone were real deterrents (for artillery was unknown) against armies that were simply cavalry hordes.

COMPLETED IN 15 YEARS

Walls dividing rival feudal kingdoms or protecting them from foreign enemies are mentioned in the Chinese Chronicles as early as the fifth century before Christ, and it is probable that portions of these previously built walls, of which vague vestiges are still traceable in some parts of Chihli and Shantung provinces, were utilized by Chin Shih Huang Ti (contemporary of Hannibal), who extended and linked them together when he built his "Long Rampart," stretching from Shanhaikwan, on the seacoast, to Minchow, in

THE EASTERN EXTREMITY OF THE GREAT WALL DIPS DOWN INTO THE SEA AT SHANHAIKWAN

Photographs from Adam Warwick

CITY GATE OF SHANHAIKWAN AND FIRST GATE OF THE GREAT WALL

Beginning with many bastions and towers, the Great Wall here starts across the plain and up the mountains. In early times this gate and castle defended north China for 30 years from the inroads of the Manchus.

distant Kansu (see map, page 116), in order to protect himself and his empire from the Huns, whom he so long unsuccessfully tried to overcome in the field. (See Panorama of the Great Wall with this number of THE GEOGRAPHIC.)

Begun in 219 B. C., the Barrier was completed in 204 B. C. Thus it was 15 years in building, seven of which were after the mighty emperor's death. To him alone, however, is due the conception of a work probably unequaled in any land or by any people for the amount of human labor bestowed upon it.

Three hundred thousand troops, besides prisoners of war and all the criminals in the land, including many dishonest officials, were impressed for the work.

How these unskilled laborers accomplished their task with the primitive means at their disposal, how they overcame the physical difficulties imposed on them by the steep slopes of the high mountain ranges, remains a marvel to this day. Moreover, the problem of getting food to them can be judged from the statement that, "of 182 loads of grain dispatched, only one would reach its destination, the rest being eaten or sold along the road."

As for the cost of the Wall, no figures have been preserved.

A weaker man might well have hesitated to plan an undertaking which, though popular in the main as a defensive measure, entailed great suffering on the people. But Chin Shih Huang Ti was one of the strongest and most remarkable characters in Chinese history or, indeed, in any history—a powerful and romantic figure, who left behind him an example of personal activity unequaled among Oriental sovereigns.

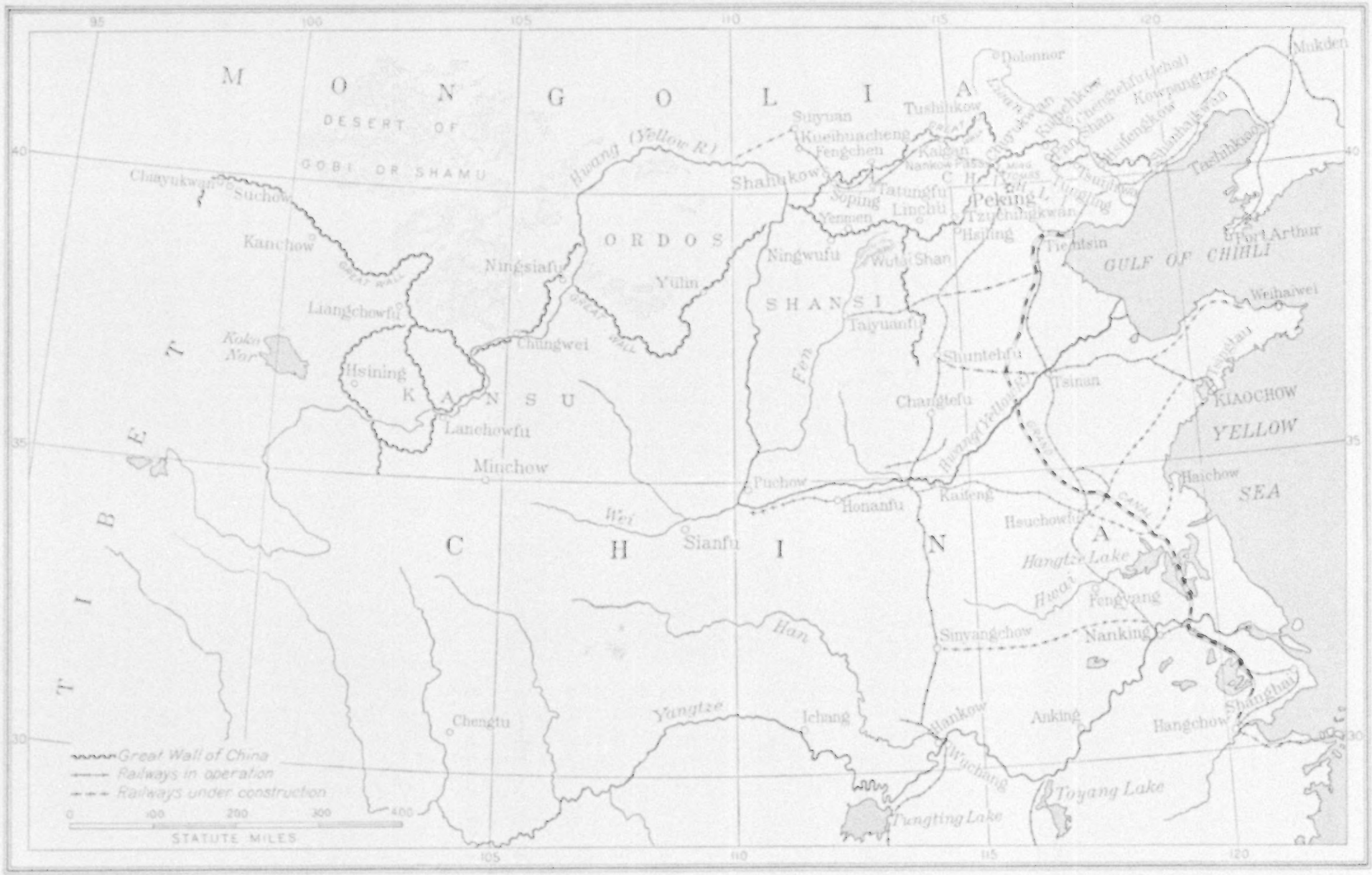
Photograph from Adam Warwick

AN IDOL WHOSE GILDED COUNTENANCE IS FULL OF MYSTERY

It is to be found in a temple near Hsifengkow, west of Shanhaikwan.

Chin Shih Huang Ti was, furthermore, the autocrat who united China by subjugating a group of warring states from 246 to 210 B. C.

Unfortunately, Chinese classical historians, "prone to describe the deeds and characters of their great men with uncompromising finality as good or bad, with strange indifference to motives," have declared anathema the name of this great molder of an empire because he burned the Classics and buried 500 scholars alive when the latter dared criticize him for



Drawn by A. H. Bumstead

A SKETCH MAP OF NORTHERN CHINA SHOWING THE MEANDERINGS OF THE GREAT WALL.

Three hundred thousand troops, besides prisoners of war and all the criminals of the land, were employed for fifteen years in the construction of the original Long Rampart, which was strengthened and embellished in succeeding centuries.

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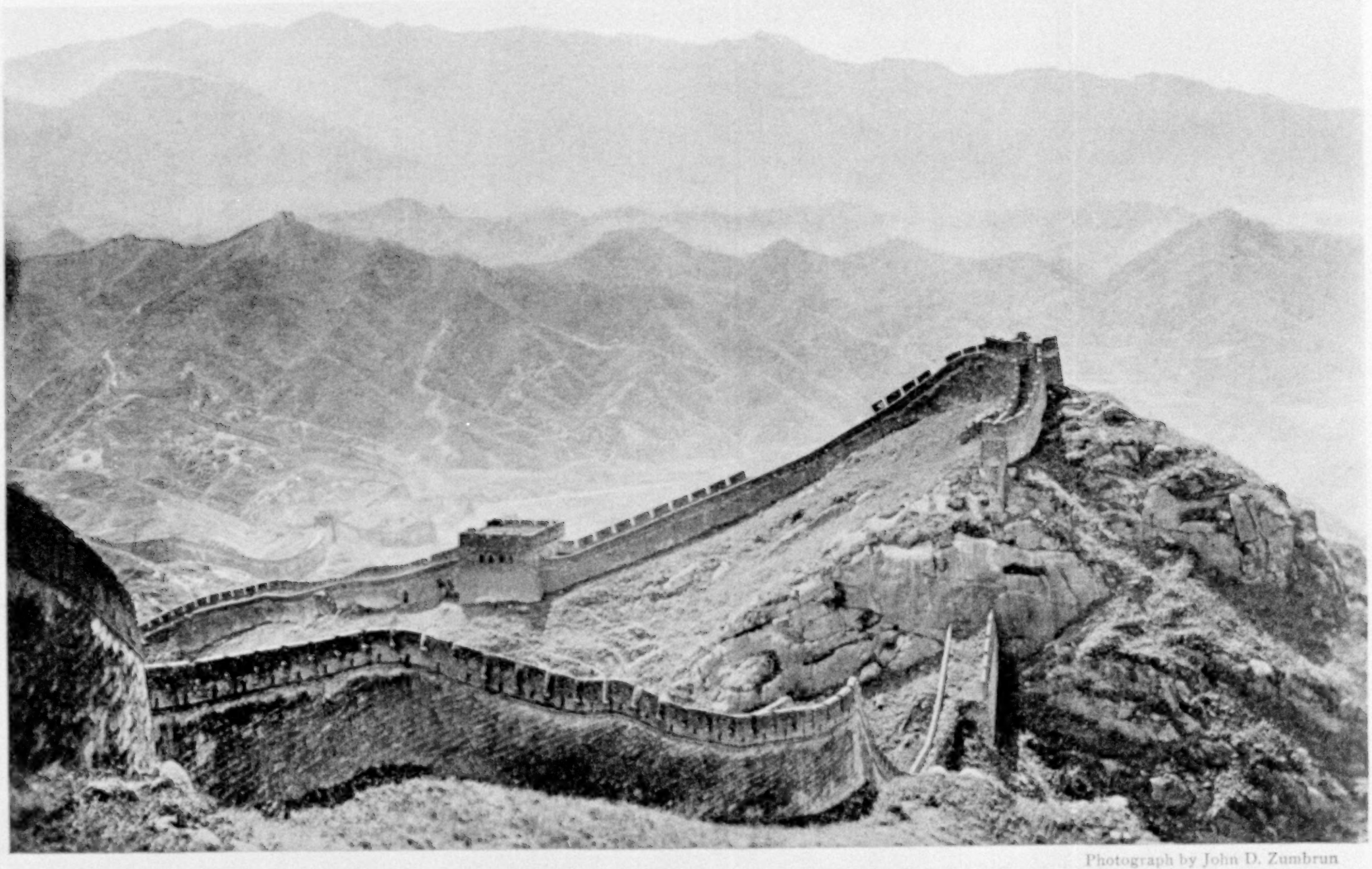


Photograph by John D. Zumbrun

AT KUPEHKOW THE WALL IS IN ALMOST PERFECT REPAIR (SEE PAGE 131)

It was at this point that a Tatar chief broke through the Great Wall and invaded the Province of Chihli during the reign of Wan Li (1573 to 1620 A. D.).

Drawn by A. H. Bumstead

WHERE THE GREAT WALL WOULD RUN IF TRANSFERRED TO THE UNITED STATES

The sketch map shows the length and direction which the Barrier would take if placed in the same latitude in the Western Hemisphere. Beginning at Philadelphia, it would extend far beyond Topeka, Kansas.

proclaiming himself the "Only First" (or First Emperor), thus sweeping away the past.

Doubtless he would have done better to have patiently ignored the opposition of these conservative literati, instead of suppressing them so savagely, on the principle that "men of letters, as a rule, are very ill acquainted with what concerns the government of a country—not that government of pure speculation, which is nothing more than a phantom, vanishing the nearer we approach it, but the practical government, which consists in keeping men within the sphere of their proper duties," as he said.

Still, no unworthy ruler could have established two principles of government destined to endure in his native land for thousands of years—the supremacy of an emperor and the non-employment of officials in their native provinces. The impression he made on following ages was great and lasting.

With his "high-pointed nose, slit eyes, pigeon breast, wolf voice, tiger heart, and stingy, graceless, cringing character," as native historians portray him, Chin Shih Huang Ti was the classical type of a Chinese military leader.

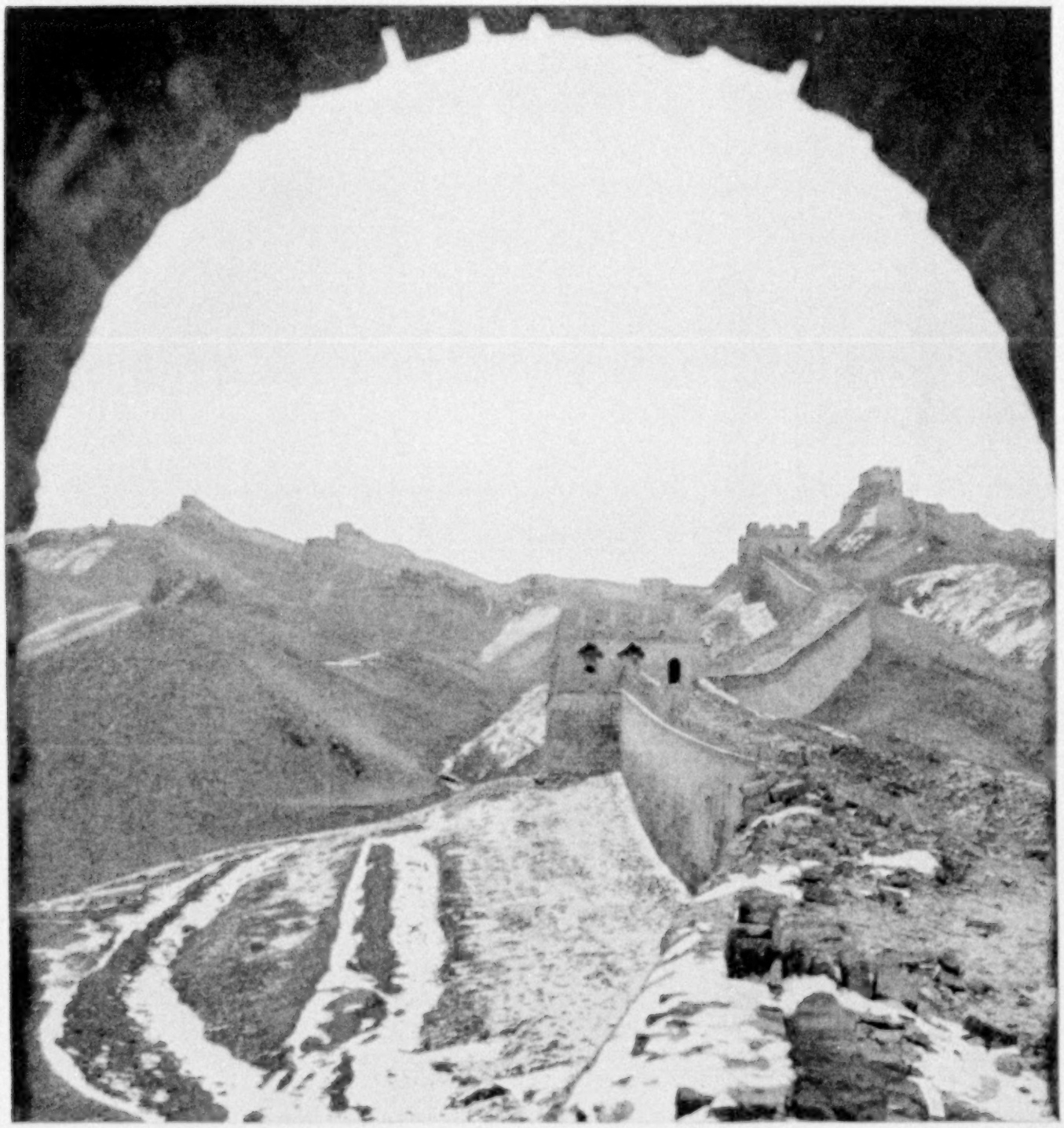
Yet he was not a great soldier himself, but simply a great fisher of men, to whose genius in choosing able lieutenants was due the first standing army in China, an army of several hundred thousand men, which he raised, equipped, and maintained in a peace-loving country to defend his Great Wall.

A MAGIC HORSE TRACED THE COURSE OF THE WALL

Wonderful stories and legends, of course, still find their place in the minds of men about Chin Shih Huang Ti and his Long Rampart. The prettiest is, perhaps, the story of how his magic white horse was supposed to have marked out the line of the Barrier.

The animal was allowed to wander freely, and wherever it went the builders followed, up hill and down dale, where no horse but a "magic horse" could find a foothold.

"At one point," so runs the legend, "the



Photograph by John D. Zumbrun

VIEW FROM AN EMBRASURE OF ONE OF THE TOWERS NEAR KUPEHKOW

workmen could not keep up with the creature, so they called a halt to drink their tea.

"Meanwhile a dry fog [probably one of the blinding dust-storms common in those latitudes] blew up, until they could neither see the horse nor its footprints; but after tea they continued in the same line for ten miles.

"Not seeing the horse yet, they became suspicious and sent one of their number up a hill to look out. He spied the animal far away to the southwest, heading in quite a different direction. So the workmen abandoned the last stretch, returned to their camp, and built a new wall of forty li [the Chinese li is roughly a third of an English mile], which still remains to prove this story."

Another legend describes how "a compassionate God in Heaven looking down and moved to pity by the sufferings of the builders, many of whom had been killed and entombed in the Wall because they could not get their work done fast enough, presented each toiler with a magic thread, bidding him tie it around his wrist.

"This gave the workmen abnormal

Photograph by J. T. McGarvey

A CHINESE BOY OF CHIHLI WITH HIS KITE

strength and they were able to satisfy the king.

"When, to his amazement, the king saw how fast and how well his people worked, he inquired the cause and found out about the magic threads. Then he seized them all and made a lash for his magic whip, which thereafter was able to work miracles, removing mountains at the pleasure of the sovereign and causing the Yellow River to stand still for the passage of his Wall."

Despite the time and labor expended upon it, Chin Shih Huang Ti's mud barrier, with the watchtowers where he quartered his garrison, soon crumbled away. There was apparently so little left of it by the sixth century A. D. that the Tungusic Wei and Tsi dynasties, who ruled over North China from 386 to 577 A. D., spoke of building, not of rebuilding, the Great Wall.

They also added a new loop, which still exists, between Peking and Kalgan, and the link running due south through Shansi, the latter again an earthen barrier intended as a protection against rivals from the steppes.

It is significant that when the Yuan or Mongol dynasty (1260 to 1368 A. D.) occupied the Chinese throne not a word about the Great Wall is mentioned in

their annals. It was useless during that period, because the conquerors needed no defense against their own kinsmen; it seems to have been neglected and forgotten, so much so that foreign travelers like Marco Polo never even mentioned it.

MINGS BUILT MORE THAN 20,000 TOWERS

But when the Chinese dynasty of the Mings (1368 to 1644 A. D.) ousted the descendants of Genghis Khan from the Dragon Throne, the Great Wall again assumed much importance. During the 276 years that they ruled the country they had to defend their empire against the Northern Barbarians, whom they had expelled but were never able to conquer in their native haunts.

The Long Rampart was therefore vital to their safety, and contemporary Chinese historians describe in great detail how they repaired it along its entire length, from Shanhaikwan to Chiayukwan fortress, on the frontier between Kansu Province and Sin-Kiang (Eastern Turkestan), adding new loops to strengthen it, from 1470 to 1592 A. D.

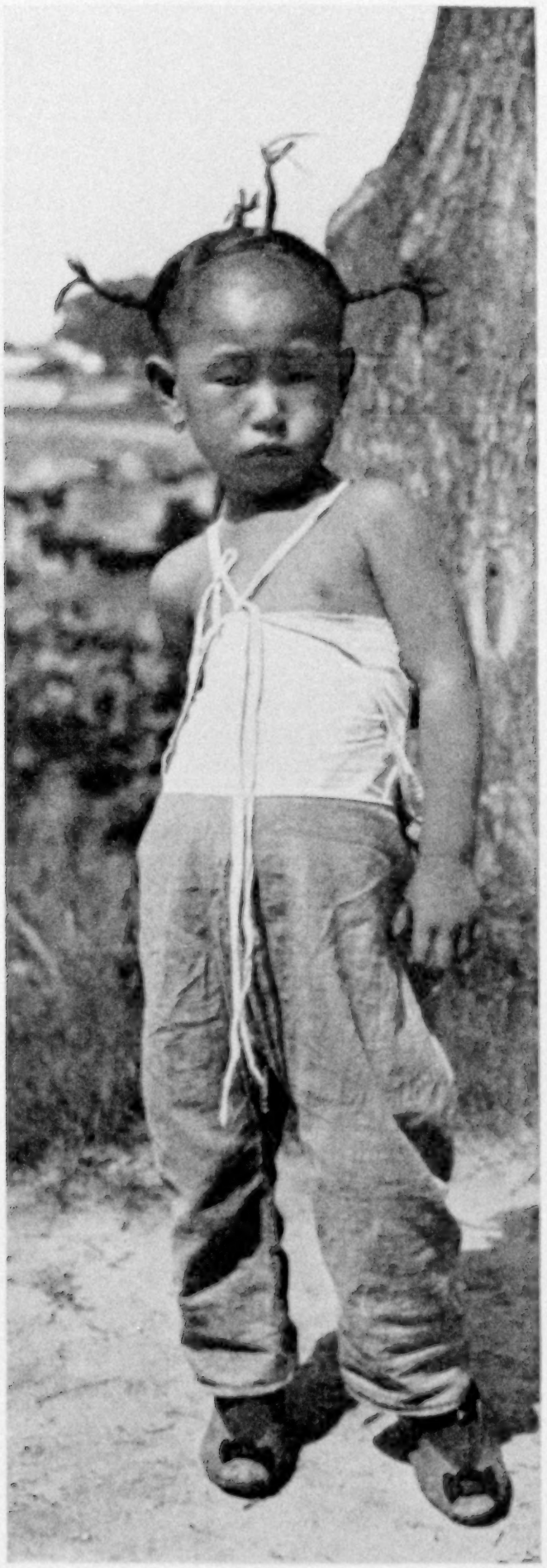
The restorations of this period were solid and even elegant, long stretches being encased in brick or strengthened with blocks of stone. "Throughout the eastern section," says Wells Williams in his admirable "Middle Kingdom," "the Wall was made 25 feet thick at the base, 15 at the top, and varied from 15 to 30 feet in height. The top was protected by bricks and defended by a slight parapet."

It was, in fact, under the Mings that the defenses of the Great Wall were most fully developed, with more than 20,000 towers, which were practically a chain of small fortresses, and over 10,000 signal beacons.

Almost every reign saw new defense works erected. Sometimes, as under Cheng Tung (1435 to 1450 A. D.), these were ineffective, since his successor, the unlucky Ching Tai (1450 to 1457 A. D.), suffered an invasion of his provinces.

CLEVER POLICY INSURES GARRISON FOR WALL

Under Cheng Hua (1465 to 1488 A. D.) a general reported that "to guard 300 miles he had 25 camps, but each contained only from 100 to 200 men, and



Photograph by J. T. McGarvey

A CHINESE FARMER'S DAUGHTER OF CHIHLI IN SUMMER ATTIRE

Her forebears tilled the soil in the shadow of the Great Wall when not on guard duty.

Photograph by J. T. McGarvey

THE LAMA DEVIL DANCE AT BLACK DRAGON TEMPLE, FIVE MILES NORTH OF PEKING

The Devil Dance is one of the greatest festivals of the Lama Church. It takes place each spring and represents the chasing out of the Spirit of Evil. Men and boys, attired in rich costumes and hideous animal masks, go through a series of postures accompanied by an impressive chant.

that one man could not guard 200 yards of frontier night and day."

Cheng Hua, realizing the danger, raised a powerful army by offering the soldiers large grants of land. This proved a clever method of keeping the troops permanently garrisoned behind the Wall contented, though at great distances from their homes, often in inaccessible frontier regions, and obliged to drill, according to special regulations, "even if there be wind or rain."

The men, who lived in fortified camps, went up to the Rampart for guard duty for a few weeks at a time, then returned to till the land in which they felt they had a stake, and on which they often remained as settlers after their military service was over.

Furthermore, this "race of warlike farmers, who labored with plow and sickle and took their turns at shouldering the spear or stood ready to light the signal fire," needed little pay, supporting themselves largely by their own labor.

As the Chinese had long known the use of gunpowder, they employed rude cannon to assist the troops in the defense of the Wall. Some of these primitive weapons were actually mounted on tripods and placed on the tops of dominating peaks. Despite them, in the reign of Wan Li (1573 to 1620 A. D.) a Tatar chief broke through at Kupehkow, and invaded Chihli.

Thereafter, on the arrival of the Jesuits, the emperor employed them to cast more efficient cannon, which were so highly esteemed that the missionaries were gazetted as Great Generals and officers were dispatched to pay them divine honors.

MANCHUS ALLOW THE WALL TO FALL INTO DISREPAIR

After the advent of the Manchus, the Great Wall had so far fallen into disrepair that Father Regis, a Jesuit who traveled along its entire length while mapping the empire by Kang Hsi's order, in 1708-1716, said it had only a facing of brick left in Chihli Province, where the Barrier stood 20 to 25 feet high, with five "mouths," or fortified passes — Shanhaikwan, Hsifengkow, Kupehkow, Tushihkow, and Changchiakow (Kalgan).

"Along the northern border of Shansi," he says, "the Wall is made of clay, without battlements, and is only about five feet high. West of Shansi it is a narrow mud rampart, sometimes even only a sand ridge. It is in better repair between Suchow and Chiayukwan, in Kansu. Thence to Hsining, on the Tibetan border, the mountains serve as a rampart, with a moat along their crests."

This testimony was corroborated by Father Gerbillon, who, when commenting on its decay, says that the Manchus made little effort to defend the old Barrier on their more distant frontiers, contenting themselves with guarding the portions nearer to the capital, the Imperial Tombs, and the main gates through which traffic passes.

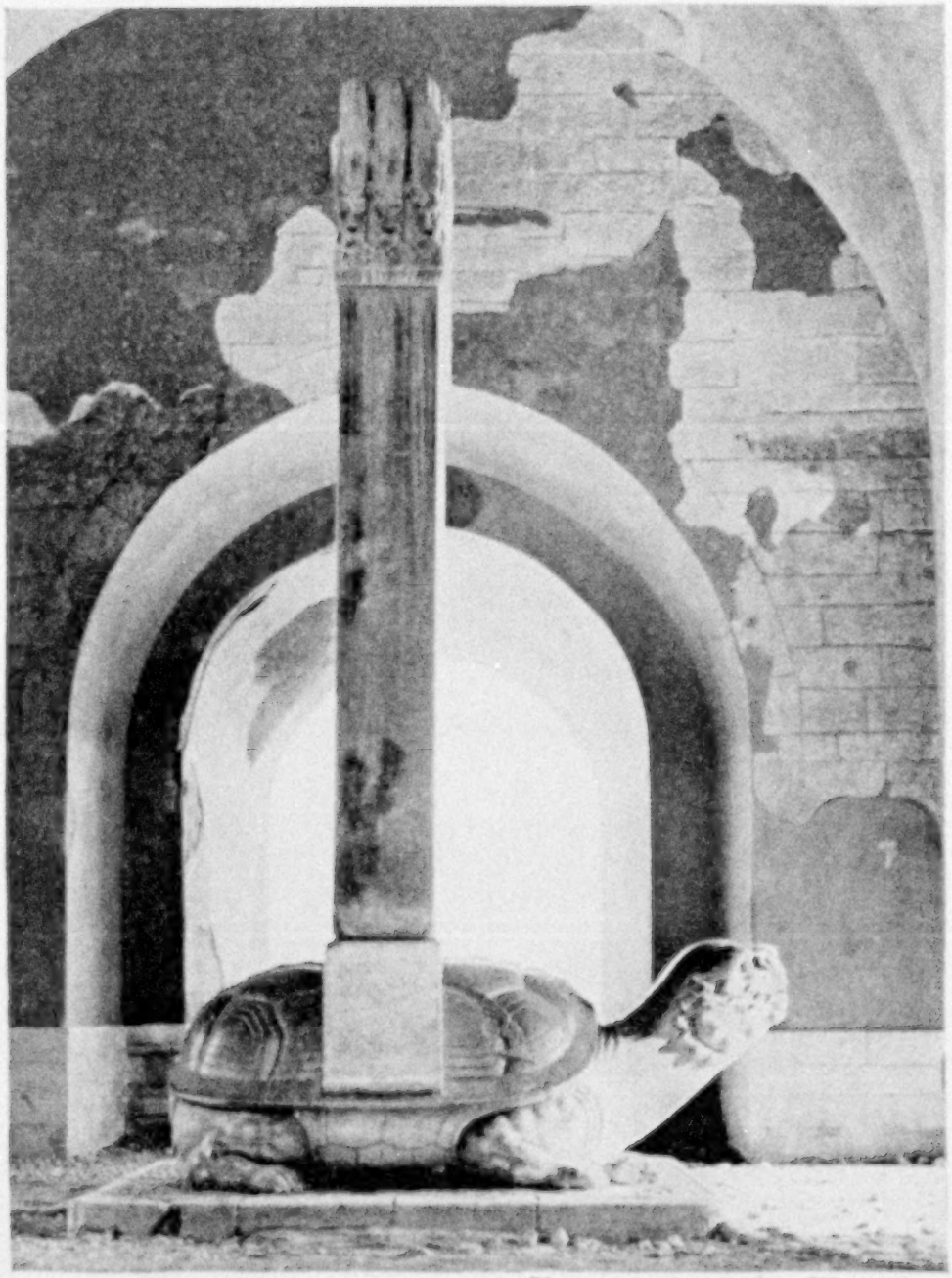
MAGNIFICENT DESPITE ITS DECAY

Yet, despite its decay, the Great Wall remains a magnificent monument, which leaves a powerful impression on even the most frivolous minds. Once seen, it can never be forgotten. But imagination fails to grasp this remarkable structure as a whole, for the "Wan-li-chang-cheng," or Myriad Li Wall, as the Chinese call it, is about 1,250 miles long in a straight line, while its turnings and windings increase it to almost 2,000 miles. This means that it would stretch from Portugal to Naples or from Philadelphia to Topeka, on nearly the same latitude (see map, page 118).

One end of the wall rises out of the sea near Shanhaikwan (see illustration, page 114). When it was built China had nothing to fear from enemies with powerful fleets, so it was obviously unnecessary to erect a barrier along the coast, where the ocean itself formed a natural one. The Long Rampart, therefore, after rising from the water's edge, starts inland in a westerly direction.

The terminal sea end of the wall is immensely impressive, where the blocks of granite, beaten upon by the waves and their ally, the wind, have broken loose and extend all awry into the water, toys for the rising tide.

Following the curve of wall, we pass the white lighthouse near by and are struck with a contrast between East and West. The eye of the modern searchlight opens and winks with startling effect



Photograph from Adam Warwick

MEMORIAL TABLET OF YUNG LOH, "WHO MOVED THE URNS OF EMPIRE"

This tablet, setting forth the virtues of the greatest of Ming emperors, is a simple bit of wood with gold lettering and represents the soul. The supporting marble tortoise is the finest in China. Yung Loh fortified Peking and made it the capital of China, but his reign is also noted for a gigantic compilation of literature on every subject, called the Grand Encyclopedia, 11,100 volumes, and for a collection of laws.

on the old Pavilion of Literature placed on the very spot where Chin's Rampart joins on to the city wall of Shanhaikwan, two miles from the sea.

Though Shanhaikwan is neither a large nor important city, it was nevertheless once the key to North China. Here for 30 years the Manchus were kept at bay and here, in the famous battle of May 26, 1644, Wu San Kuei managed to overcome Li Tzucheng's vastly superior forces after hours of bitter fighting in a furious sand-storm.

"If every man does his best," said the redoubtable leader, "the Empire is ours." An irresistible charge followed his stirring words and proved the turning point of the Manchu invasion of China.

TRAIN RUNS THROUGH GAP WHERE PRINCE'S BODY LAY

To-day the spot that once resounded with the blare of war trumpets is disturbed by the whistle of a train following a track that actually runs through the Wall.

Popular sentiment in the days when the line was being built would certainly have forbidden the piercing of the Wall for such a purpose, but the peasants say that an opening was there conveniently to hand, ready to allow the passage of the iron horse, and they tell a pretty story to account for it, about a prince employed by Chin Shih Huang Ti in the construction of his barricade.

"One day," runs the legend, "this prince mysteriously disappeared, as often happened in those times. But his beautiful and devoted wife soon set forth along the Wall in search of him.

"After passing through innumerable hardships, she discovered that her beloved husband was dead and his body entombed somewhere within the Rampart. Just as she was despairing how to find him, a fairy appeared and bade her cut her hand and follow the drops of blood that flowed

Photograph by J. T. McGarvey

FARMING ALONG CHINA'S SACRED WAY, LEADING TO THE MING TOMBS

The thirteen tombs of the Ming dynasty are approached by a great roadway lined with gigantic monoliths of men and animals. The location of the Mount of Imperial Longevity was decided by a geomancer with the aid of a magic tortoise shell and by a study of the *Book of the Blue Bag*, a classic 1,000 years old. The Ming dynasty refortified the Great Wall and long held it against the Tatars.

from the wound. She did as she was directed and her blood brought her to the object of her desire lying in an opening that had been made miraculously in the Barrier."

Throughout the ages this opening was never closed, and it remained for a prosaic railroad to desecrate the spot where the beautiful girl found her dead lover.

It is easy to ridicule such pretty fancies, but not so easy to put facts in their place.

Beyond Shanhaikwan the Great Wall starts off toward the mountains. Soon it begins to climb the steep slopes. Thereafter for the first 300 miles of its course it is never on a plain, but rises steadily to the height of nearly a mile above sea-level.

It is indeed a wonderful and an amazing experience to stand on some outjutting parapet, which compares well with a box at the theater, and gaze down on an enchanted scene of fruitful plain and distant sparkling water, or upward to peaks tipped with towers that appear like the donjon-keep of some old knight's castle.

For several days the traveler who has sufficient patience and endurance to follow the line of the Wall is rewarded by magnificent scenery. Even the least imaginative are humbled and impressed by the panorama of mountains with sharply silhouetted crests and deep gorges—masses of contrasting black shadow. But upon those with a reverence for and some knowledge of the past, the effect of the Rampart in such surroundings is simply stupendous.

No description can convey an adequate idea of the immensity or grandeur of the Great Wall of China, as it writhes along the mountain peaks, giving an impression of infinite power and at the same time of infinite calm and peace. It surpasses our richest expectations. The more we gaze upon it the more we wonder and admire, and even a thousand miles of travel in its mighty shadow seems insufficient to enable

XUM

Photograph by Adam Warwick

A STONE FIGURE OF BUDDHA AT TATUNGFU

This stone cave temple, as well as those at Lung Mên (see opposite page), belongs to the period of the North Wei, a barbarian dynasty which first made Tatungfu its seat in 398. The rulers of this state kept up intimate intercourse with the Buddhistic countries of central Asia and built many large temples. Four persons can play bridge on the palm of this statue's outstretched hand (see text, page 134).

us to grasp the proportions of this enormous barrier, which continues its uninterrupted way for hundreds of leagues toward the wilderness.

FEW INHABITANTS IN MANY REGIONS TRAVERSED BY THE WALL

For great stretches along the Wall there are no villages nor any signs of human habitation, and silence reigns save for the occasional cry of a high hovering eagle. No conqueror's foot would lightly climb the slopes of these desolate regions, and it seems indeed a useless waste to have built a barrier where inaccessibility alone would have insured safety.

In many places there is a sheer drop of several hundred feet from the base of the Rampart, and the *terre-plein* itself is very steep—sometimes so steep that it is necessary to be hauled up for short distances by ropes.

The approaches to the towers are often obstructed by huge boulders, making it difficult to judge from a distance where the Wall begins and the mountains end. They seem, indeed, to have grown into one another.

Photograph from Adam Warwick

ONE OF THE COLOSSAL STONE CARVINGS AT LUNG MÊN, HONANFU

The cave temples in which these figures are to be found stand on a hillside and have been carved out of huge natural rock. One of the temples at Honanfu marks the burial place of the white horse which legend says was led by the missionary monks from India who first introduced Buddhism into China (see text, page 134). Near the city is Hanku Hsinkwan, where General Hsiang Chi of Chu buried alive 100,000 captive soldiers in the third century B. C.

TWIN PAGODAS NEAR TAIYUANFU

The pagoda to the left, dating from the Sung dynasty (960 to 1260 A. D.), leans toward its neighbor and is China's counterpart of Pisa's famous tower (see text, page 141).

But the traveler is well repaid for the hard climbing required to reach such lonely spots. His is the reward of a discoverer, for few white men have set foot here before him.

It seems unlikely that even permanent Chinese garrisons were stationed in such places. A solitary sentry would suffice to guard long distances in these inaccessible regions, especially since we know that an elaborate system of beacon fires was perfected to bring reinforcements against any threatened point.

Now and then, in the lower levels, we find a village leaning against the Wall, where an occasional traveler takes shelter for the night in the guest room of the local Buddhist temple. Happy is the hamlet that lies near a river or a shallow lagoon and happy the passer-by who halts there!

The greatest drawback to the stages in the higher altitudes is usually the lack of water for a much-desired bath. Wells in the heights are few and deep, so the peasants object to drawing more water than is required for the most elementary washing and tea-making.

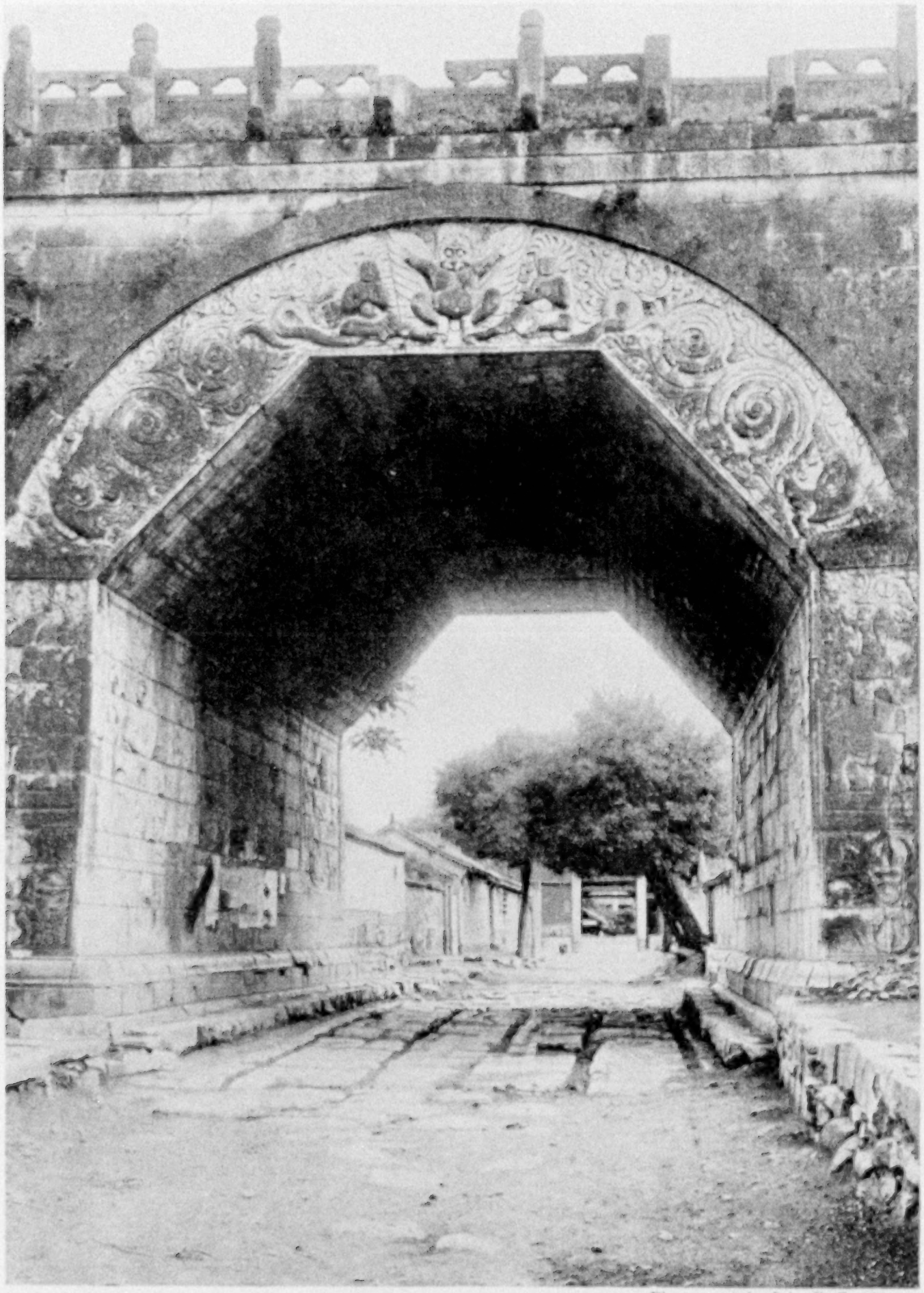
In some places water must be carried from a long distance in wooden buckets on donkey back. Goiter is unfortunately very prevalent in many sections, due to using water that has filtered through rocks heavily impregnated with minerals.

PEASANTS HARNESS THEMSELVES TO THE PLOW

Along the first few hundred miles of the Wall the country folk are miserably poor; they wrest a living from the stony soil with great difficulty. But wherever there are patches of flat land every inch is cultivated, and sometimes the crops extend up the rocky mountain slopes.

Often the hard-working peasants, too poor to afford the luxury of a beast of burden, harness themselves to their primitive plows. Yet everywhere one meets honest, smiling faces. Little children offer the stranger bouquets of wild roses and clematis; men and women toiling in the fields greet him with the polite salutation, "Have you eaten your rice?"

The village elders still believe that the Emperor, father of his people, is on his



Photograph by John D. Zumbrun

THE LANGUAGE ARCH AT CHUYUNGKWAN

Kublai Khan made the Lamaistic form of Buddhism the state religion of China and invited teachers from Tibet. This archway shows the Tibetan influence. It is a massive structure of marble, dating from 1345, and bears numerous carvings of Buddhistic images and inscriptions in six languages (see text, pages 137-139).

Photograph by J. T. McGarvey

THE GREAT WALL AT NANKOW PASS (ALSO SEE FRONTISPIECE)

This is the section of the Long Rampart which is most familiar to the tourist. The Pass is a much-used caravan route from China into Mongolia (see text, page 137).

throne. They have not heard and do not care to hear about the establishment of a republic.

"It is not for us to concern ourselves with the problems of government," they say when naively summing up their simple political creed. "Our business is farming, and that takes all our time and strength."

These hardy mountaineers mind their own business and mind it well. They have their reward, moreover, in contentment and in simple faith; for in their own way they are wise philosophers and religious folk.

Along our route we found many shrines dedicated to many gods, and especially to the guardian spirits of the Wall itself. True, many of these shrines are neglected now and the rain pours through grass-grown roofs on the heads of broken idols, because their worshipers are scattered. But they had their share of incense and adoration in the distant days, when this region was more thickly populated than it is at the present time.

Of those temples that remain intact a very curious cave shrine in the hills not far from Shanhaikwan has been enlarged and dedicated to the Eighteen Genii ("lohans"). Scarcely less worthy of notice is a fine temple farther on, near Hsifengkow, with a large idol whose gilded countenance is full of mystery and the divine calm of perfect repose (see page 115).

THE IMPERIAL BURIAL GROUNDS

Hsifengkow is the first important pass across the mountains and is marked by a barrier gate. Not far away is the Imperial burial ground, known as the Tung Ling, or Eastern Mausolea, where five of the Manchu sovereigns lie, including the most famous of them—Chien Lung, Kang Hsi, and the Dowager Empress Tzu Hsi, whose magnificent sepulcher was in course of construction for more than 30 years.

Scattered through a splendid park, the fine tomb buildings are a dream of gorgeous orange and red against a background of somber firs that in their turn stand sharply silhouetted against a range of mountains, crowned by the Wall, shining in the sunlight like a silver diadem.

The wooded inclosure is the haunt of many rare animals, including a little-known species of monkey. Geil, who made a trip along the whole length of the Great Wall, besides many excursions from it, in 1908, says that the Imperial Forest Preserve at the Tung Ling contains "three varieties of wild cats, three hamsters, and two jerboas, besides the curious goitered antelope and many other creatures; whereas in another large forest a day's journey south of the Wall, at Ningwufu, in addition to the above, we find the roe deer, Peking stag, leopard, wild pig, and David's squirrel."

Some distance beyond the Eastern Tombs the Myriad Li Barrier skirts the famous Pan Shan Hills, with their well-known Buddhist sanctuaries and old "sotobas" covering the graves of abbots, doubtless famous churchmen in their day.

Here the Wall is partly in ruins, in striking contrast to the section near the famous Pass of Kupehkow, where many sections are in almost perfect repair. Here, indeed, we see it at its best, as it crawls over the mountains from peak to peak, mounting a crag to leap down into a valley or dip suddenly to a picturesque river.

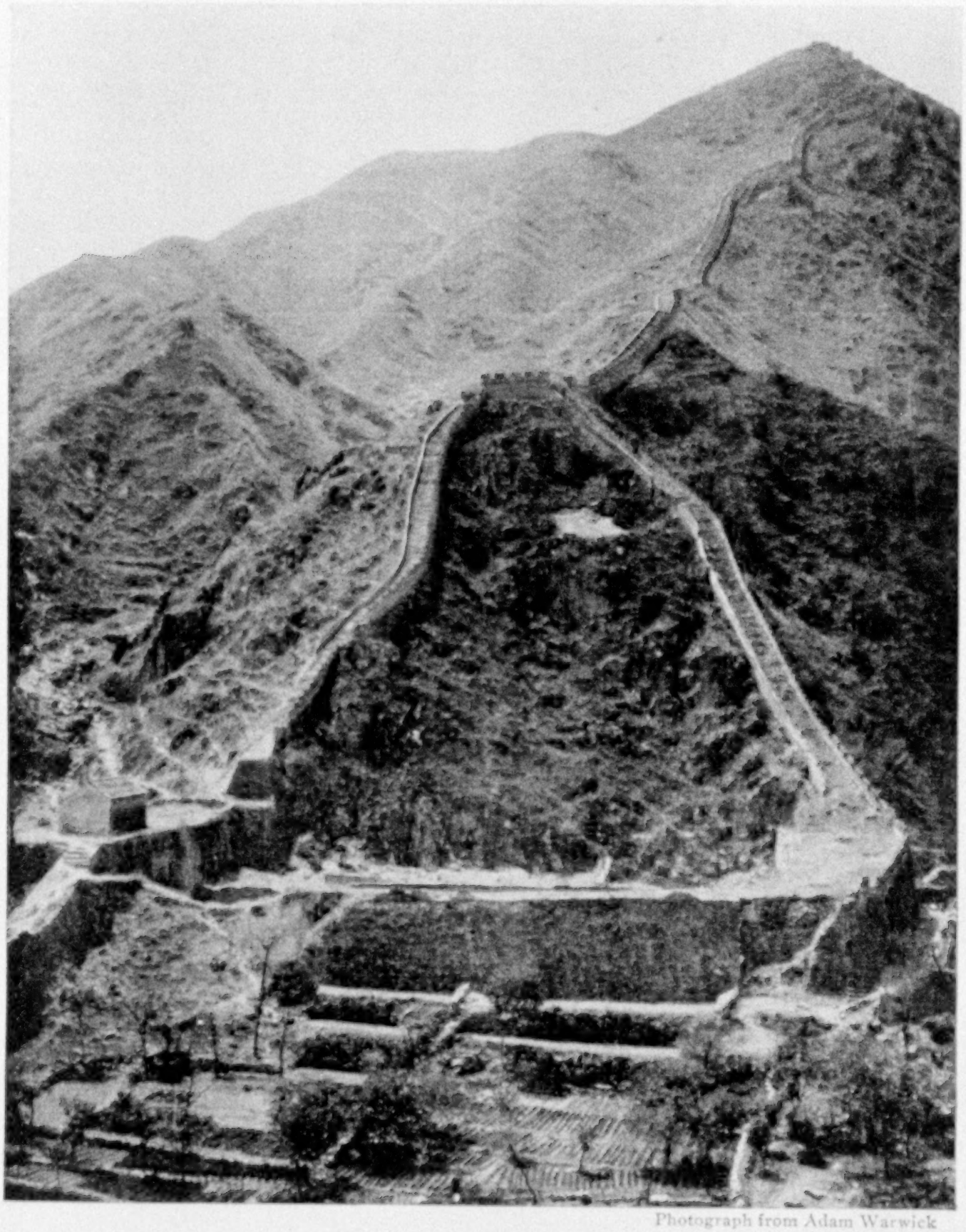
"Standing on the highest point at Kupehkow, one sees the cloud-capped towers extending over many declivities in single files, both east and west, until, dwarfed by miles and miles of skyward perspective, they dwindle into minute piles, yet stand in solemn stillness where they were stationed 20 centuries ago, as though condemned to wait the march of Time until their builders return.

"The winding dike at their feet may be followed, as it leaps across the gorges or lies buried in some chasm, or scales the cliffs and slopes in very exuberance of power and wantonness to vanish in thin, shadowy lines at the horizon.

"The entire extent of the main and cross walls visible from the pass at Kupehkow is over 20 miles and in one place they cross a peak 5,225 feet high."

Their excellent preservation is, moreover, a remarkable tribute to a solidity of construction that has withstood great extremes of climate.

Between Kupehkow and the next important pass of Tushihkow, the wall divides into two loops. One, the outer,



Photograph from Adam Warwick

SUBSIDIARY DEFENSE WALLS IN THE NANKOW PASS

One of the first-class fortresses along the Great Wall was once located at the Nankow Pass and it turned back the Mongols under the leadership of the redoubtable Genghis Khan, who finally broke through at the "Goose Gate" Pass (see text, page 139).

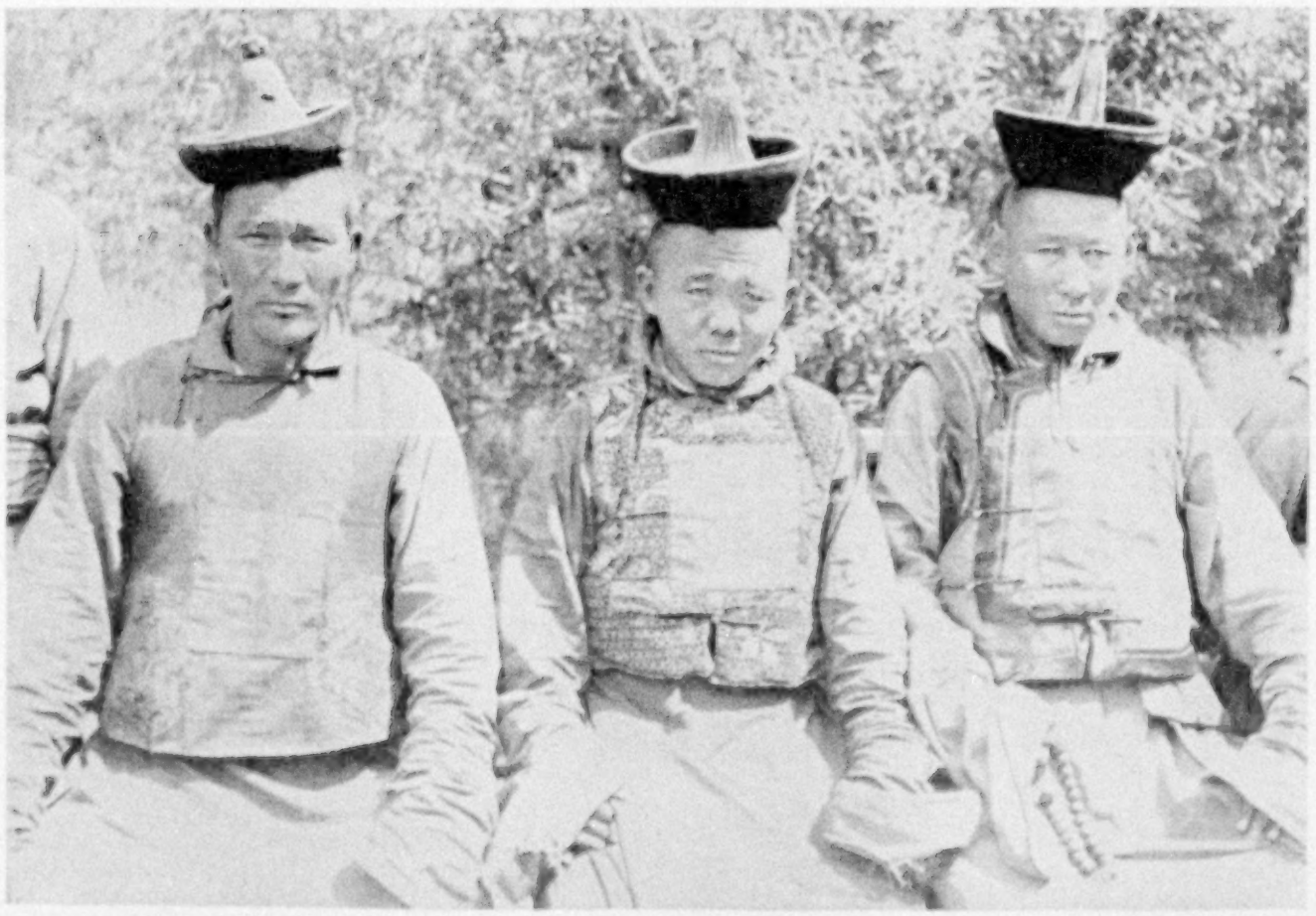
passes through the Tushihkow and, crawling westward into the eye of the setting sun, continues, still through magnificent mountain scenery, to Kalgan—a quaint medieval city known as the Gateway to Mongolia.

Beyond this little gray town it wanders along the Mongolian plateau where, to

Photograph by John D. Zumbrun

MONGOLIAN CARAVAN ROUTE THROUGH NANKOW PASS

"A remarkable Thermopylæ 15 miles in length," Nankow Pass was the northwestern gateway to China. Though a railway now runs through this pass, it is still a caravan route of some importance (see text, page 137).



Photograph from Horace Brodzky

MONGOLIAN POLICE OFFICERS

The principal work of these men is to catch horse thieves. A man guilty of this crime in Mongolia is put in a box, in such a position that he can neither sit down nor stand up. There is a small hole in the box through which the prisoner can put his hands and reach for his food. The box is kept in a cellar and is never cleaned out. The prisoner usually dies in less than six months.

the north, the picturesque Children of the Wilderness* tend their flocks and herds.

The Barrier here is for the most part in ruins, often no more than a ridge of stones and clay intersected by small square towers far less impressive than those in the eastern section—towers accessible only through their windows by means of ladders.

A COLOSSAL STATUE OF BUDDHA AT TATUNGFU

To the south lies the city of Tatungfu, an important commercial center, whose chief claim to our interest, however, lies in a rock temple where we find a colossal figure of Buddha carved in stone (see illustration, page 126). Its size may be judged from the fact that four persons can comfortably play bridge on the palm of the outstretched hand.

This and other sculptures in the neighborhood date from the fourth century A. D. and were made under the Northern Wei dynasty, representatives of a Tungusic and savage race who nevertheless showed themselves eager for the light of the new gospel then spreading over the East.

These colossal monuments rival in imposing proportions the famous Buddhist sculptures of the Lung Mên Valley (so ably described by Chavannes), near Honanfu, dating from about the same period. They are the finest specimens of the so-called Gandhara art which carried, through the Greco-Bactrian kingdom that has become Afghanistan, a reminiscence of Hellenic ideals to the shores of the Yellow Sea (see illustration, page 127).

Farther west the Long Rampart is pierced by the Shahukow (gate), an important customs station on the big trade route between the Mongolian mart of Kueihuacheng (the "Blue City") and

* See "The People of the Wilderness," by Adam Warwick, in THE GEOGRAPHIC for May, 1921.

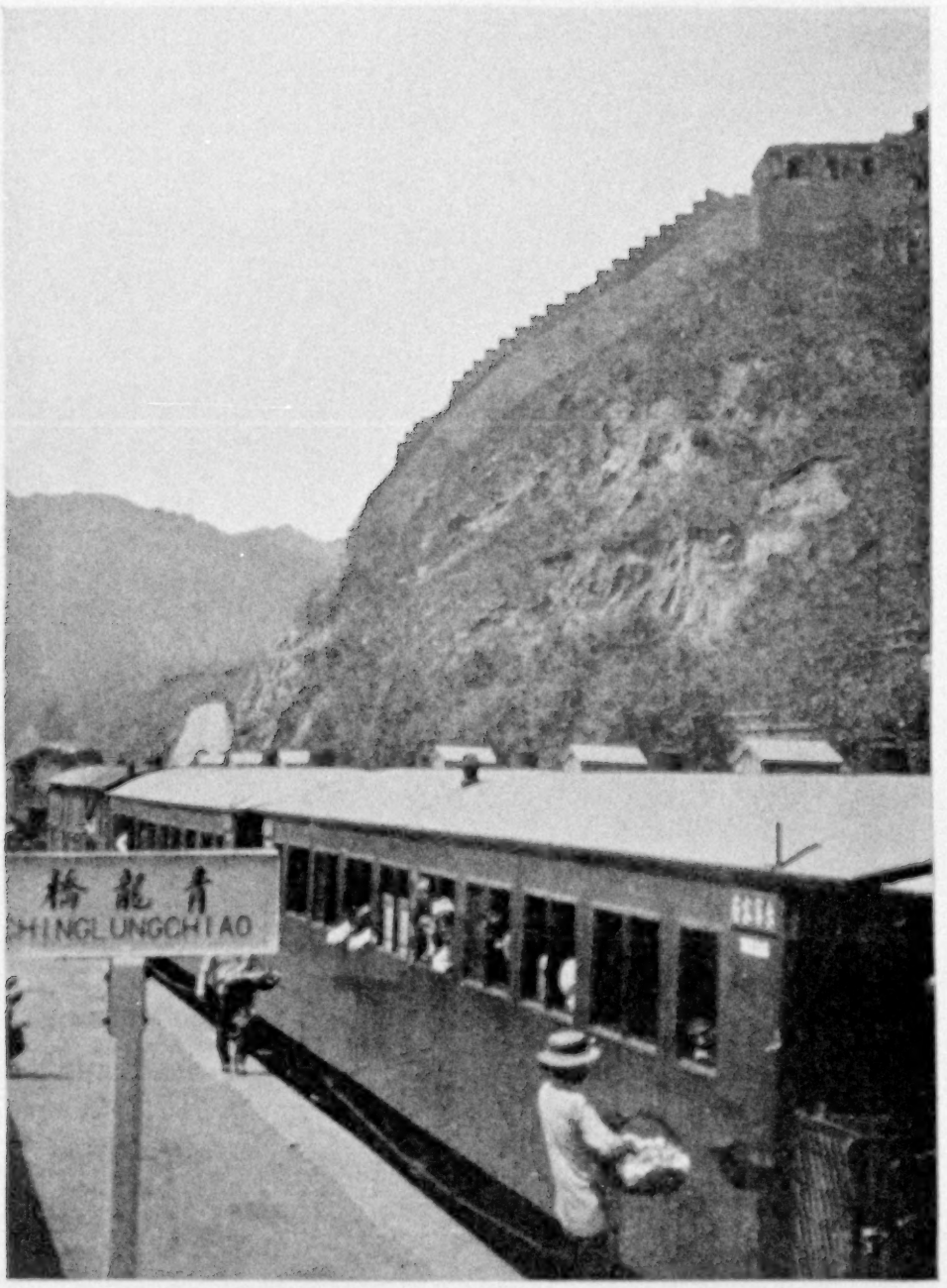
China proper. Thence it is but a short distance to the point where the outer loop of the Wall joins the inner loop.

The latter, commonly known as the southern loop, has as much, if not more, historic interest than the former, though it is not the work of Chin Shih Huang Ti, but was built several hundred years later and rebuilt by the Mings in 1487.

BUILDER OF PEKING LIES ON JEWELED BEDSTEAD

First of all, it passes near the Ming Tombs, one of the grandest royal sepulchers in the world. Here Yung Loh (1402 to 1424 A. D.), the splendid sovereign who laid out the city of Peking as a Chinese capital, has a tomb which even in its decay remains a marvel.

The huge vault where he lies on his "jeweled bedstead," in his richly lacquered coffin, is said to have cost several million dollars even in his day.



Photograph by R. E. Baber

THE PEKING-KALGAN RAILWAY CUTTING THROUGH THE GREAT WALL

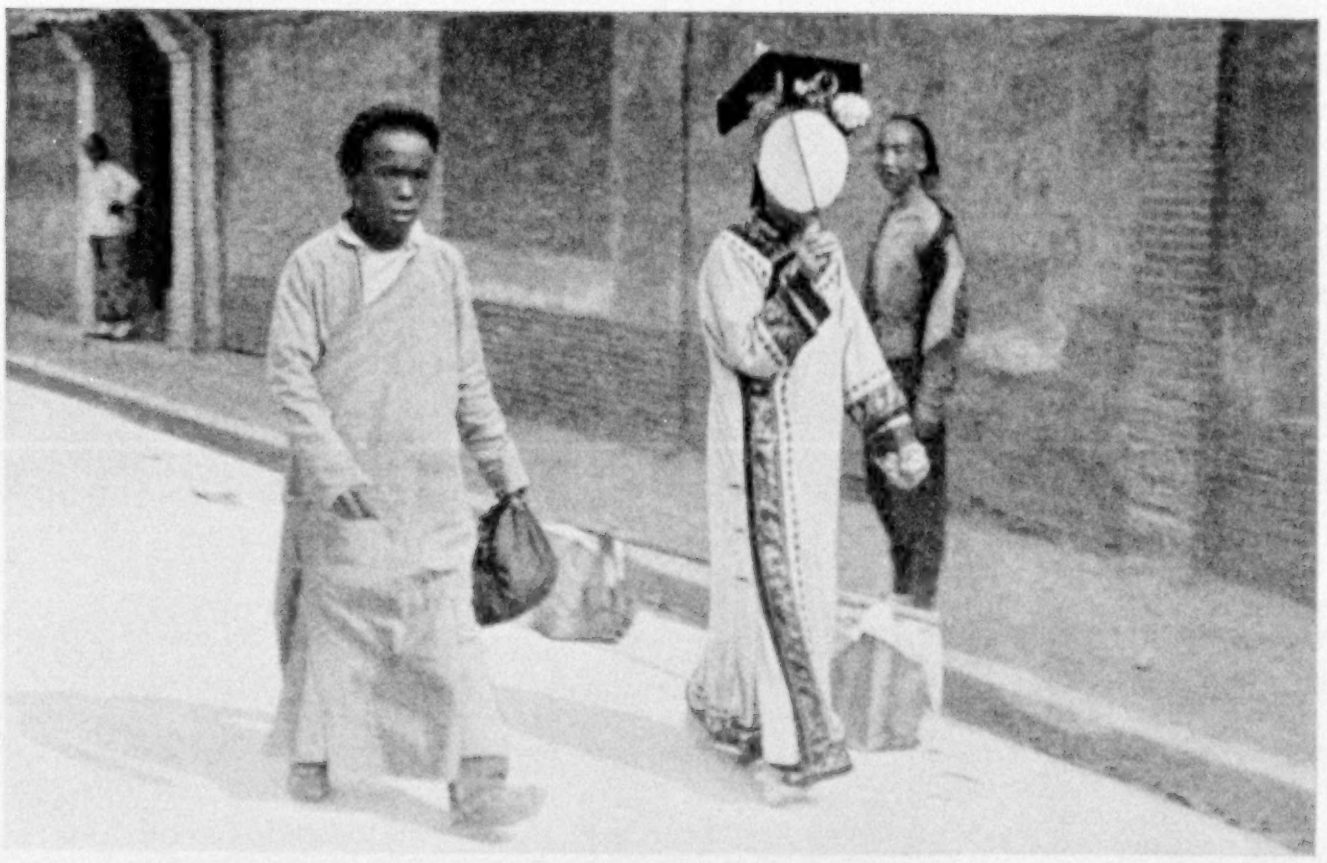
Railroads have made a few parts of the "Martial Barrier of all under Heaven" accessible to tourists; but usually the traveler must either walk or ride donkey back to obtain a true appreciation of the bewildering vastness of this eighth wonder of the world.

Around him, in the same peaceful valley, are the graves of his successors, less imposing yet scarcely less lovely on a smaller scale.

Fortunate are those travelers to whom it is given in the soft days of spring, when fruit blossoms dot the hill slopes, or in the radiant autumn days, when the persimmon orchards are hung with golden fruit like glowing lanterns, to follow the Spirit Road under the handsome marble archway (the finest in all China) past the noble red Tablet House and the carved Pillars of Victory, then along the impressive avenue of stone animals to this unrivaled sepulcher.

Hard by, along the Great Wall itself, rest the Christian martyrs who, fleeing from the Boxers, in 1900, took refuge in the towers only to perish after all and lie in humble graves under the shadow of the Barrier.

Where could one find a more striking contrast than these simple sepulchers of simple Christians and the handsome tombs of kings?



Photograph by Alice Schalek

A MANCHU WOMAN WITH HER MAID

The fan is here employed to protect the high-class oriental from the audacious eye of the camera.

Photograph from Horace Brodzky

ONE UNMARRIED AND TWO MARRIED MONGOLIAN LADIES

Only a married woman in Mongolia is allowed to do her hair up in "elephant ears." These ears are made by plastering the hair in clay and then drying it between two boards. The two matrons are wearing silver crowns which they seldom take off. When they "go out" they put their hats over the crowns. Their costumes are of brilliantly colored and elaborately embroidered silk.

Photograph by J. T. McGarvey

IT WAS TO PROTECT CHINA FROM HER ANCESTORS THAT THE GREAT WALL WAS BUILT

This is a Mongolian girl of the upper class, whose forefathers, undefeated in the field, were shut out from the plains of China by Chin Shih Huang Ti, who built the Long Rampart from the seacoast to distant Kansu.

Scarcely less well known than the Ming Mausolea is the tourist-ridden Nankow Pass, "a remarkable Thermopylæ 15 miles in length, which leads from the plain to the first terrace of mountains above it and at one time was guarded by five additional walls and gates."

This narrow defile used to be and still remains to some extent the caravan route to Mongolia. It was first opened up, according to legend, by the deities known as the Five Tiger Ghosts, patrons of artillery, who blew a passage through the rocks with their cannon.

A railway which is a fine feat of engineering now runs through this gorge, and from the train window the lazy or the hurried traveler catches a glimpse of camel caravans toiling up by road, or shaggy Mongol ponies being driven down from the plains, or, if his eyes be very sharp indeed, of the famous archway at Chuyungkwan (dating from 1345 A. D.), with inscriptions carved in six different

Photograph by J. T. McGarvey

CAMEL CARAVAN, WITH SUPPLIES, DESCENDING KALGAN PASS

Several caravan routes unite at Kalgan, which is a gateway to Mongolia and a great trading center for China and Siberia. Over 100,000 camels are said to be used in transporting tea alone from Kalgan to Siberia. In the internal caravan trade no less than 1,200,000 camels and 300,000 oxcarts are employed. At Kalgan exists the very earliest, original wall, built by the Emperor Chin, contemporary of Hannibal.

languages, which so long puzzled archeologists (see illustration, page 129).

The neighboring fort once ranked as one of the first-class fortresses along the Great Wall, as a tablet erected by a Manchu emperor testifies.

This stronghold did indeed turn back the Chin Tatars (1125–1234 A. D.) in their heyday, and twice also its defenders resisted the Mongols, once under the personal leadership of Genghis Khan (1215 A. D.). But the mighty captain, unwilling to accept defeat, brought his forces to bear against the famous Yenmen, or "Goose Gate" Pass, in Shansi, on the same southern loop of the Wall, and broke through there by stealth, debouching onto the plains of Chihli while the valiant garrison of Chuyungkwan was waiting for another assault.

The whole of the Nankow Valley is wild, rugged and exceedingly picturesque, with subsidiary walls for secondary defense climbing down into it. From the top of the pass there is a grand panorama, with towers standing like sentinels against the sky-line. The Great Wall crosses the caravan road squarely at the Pa Ta Ling, as this place in the pass is commonly called; but the wooden gate, which used to be closed at sunset only to reopen at daybreak, has disappeared.

In order to appreciate the view in all the grandeur of its true perspective, the traveler should mount the Rampart beside this gate and climb to the highest tower of the eastern spur—an ascent so steep that the *terre-plein* takes the form of steps. No matter. The uninterrupted *coup d'œil* of miles of machicolated wall, with 28 towers an arrow's flight from one another, is well worth the effort (see frontispiece).

As this was one of the important passes, capable of admitting carts and horsemen, big guard posts of a hundred men or more used to be stationed in many of these towers, which were equipped, according to the records, with food, fuel, medicines, and weapons to withstand a siege of several months. Treasures of antique cannon and small arms were discovered not long ago in one of these bastions.

It is interesting to note that when this loop of the wall was first built, in 555 A. D., 6,900 workmen were employed per mile, or on the whole 300 miles 180,000 workmen.

Continuing southward beyond Nankow, the Inner Loop passes near the Hsiling, or Western Mausolea, of the Manchu dynasty, where those emperors whose tombs are not at the Tung Ling lie buried. Thence it continues in the same direction toward Linchü, following along the tops of the mountains in an unequaled natural setting.

The "southern stump" branches off here, running down through the curious loess country along the Chihli-Shansi frontier. Close by is the sacred mountain of Wutai Shan.

That this favorite Mongol place of pilgrimage should be within the very wall which was erected and defended in order to keep the Mongols out of China is a strange anomaly.

HILL SACRED TO BUDDHA NOW A SHRINE OF LAMAISM

Yet Wutai, one of the Four Famous Hills of Buddhist China and intimately connected with the beginnings of Buddhism in the Middle Kingdom, has in course of time become a seat of Lamaism. Most of its monasteries are reminiscent, both in architecture and in faith, of Mongolia and Tibet. Most of its pilgrims come from the steppes. The great majority of its monks are non-Chinese.

The presiding deity is the reincarnation of the Goddess of Wisdom, the Bodhisatva Manjushri, and the ruling ecclesiastic, Vicar of the Living Buddha, is the Gusri Jassak Lama, a septuagenarian of great intelligence and force of character, as his strong face shows.

He lives in the Pusa Ting, the largest and finest of the temples that dot the mountain side, and receives the faithful, who, in the bitter cold of winter as in the broiling heat of summer, climb the interminable flights of steps to this "blessed spot of earth, destined to survive the eternal ruin which is to ensue at the close of the world's existence; even the beast of burden which eats the grass and drinks the water on this holy spot will be reborn into a higher stage at its next existence." So say the Holy Books.

The lover of history and of antiquities will not begrudge the time required to

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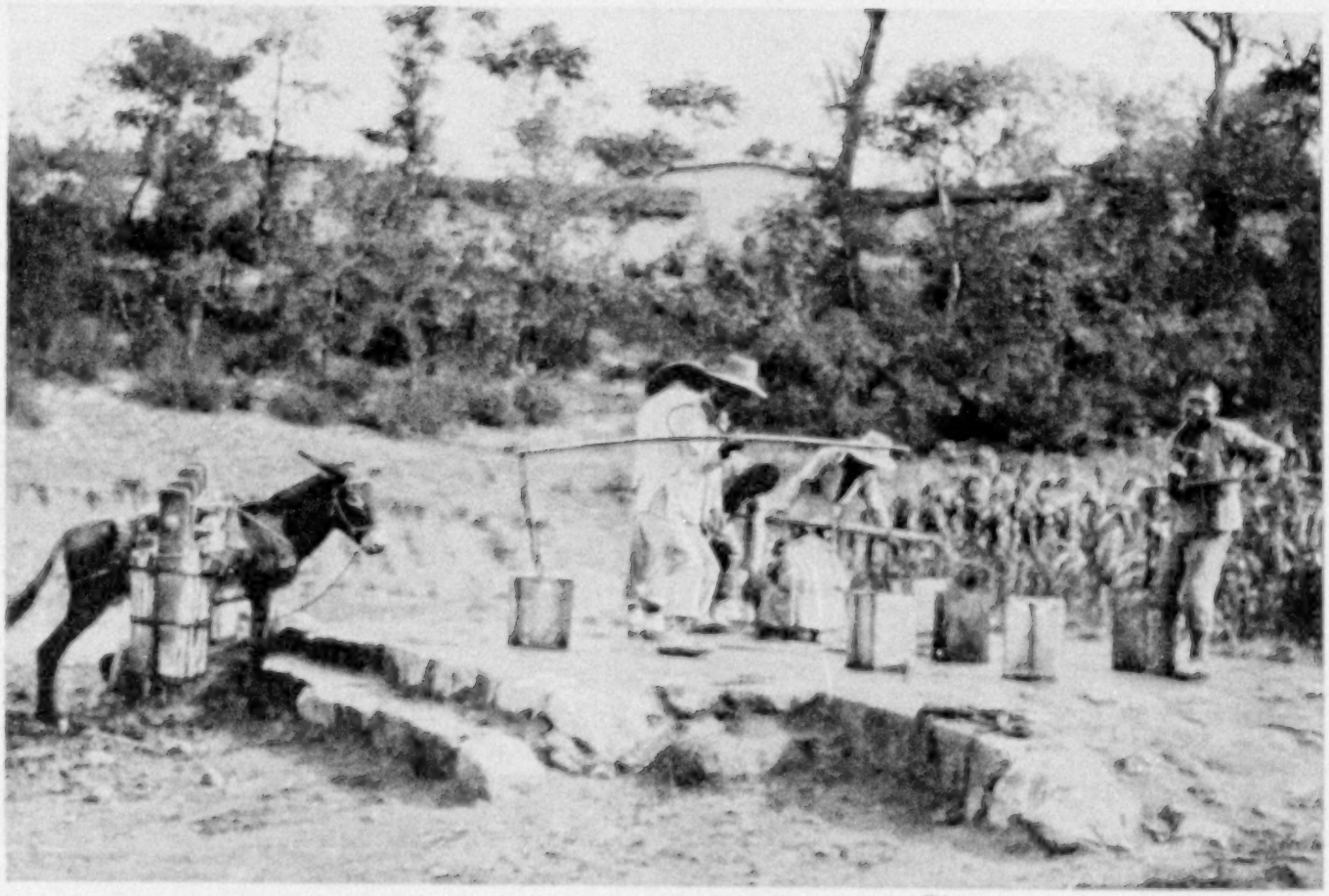
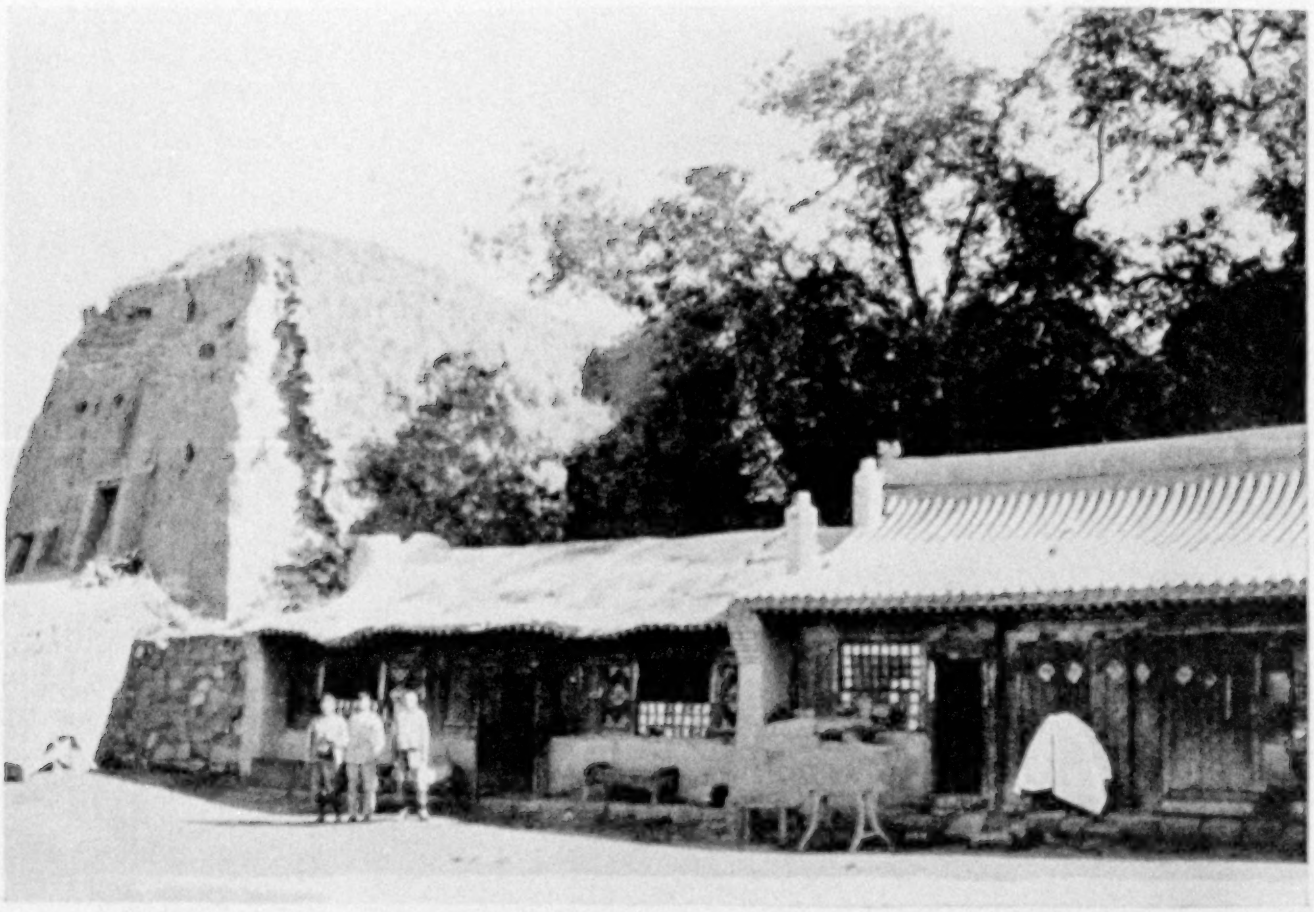
A LITTLE VILLAGE LEANING AGAINST THE GREAT WALL



Photographs from Adam Warwick

A GLIMPSE OF LIFE IN THE SHADOW OF ONE SECTION OF THE GREAT WALL

Here water is being carried in wooden buckets on donkey back. The greatest drawback to travel in the higher altitudes is the lack of water for a much-desired bath (see text, page 128).



Photograph by R. E. Baber

A HOSTELRY IN THE SHADOW OF THE GREAT WALL

Humble inns near the Great Wall form the chief dependence of the traveler when making an extensive survey. Many bear picturesque names—the Inn of Increasing Righteousness, the Inn of Accumulating Prosperity, the Broad Harmony, and the Virtue Abundant. The walls are frequently inscribed with verses and maxims written by merchants from Tibet and Mongolia, princes and shepherds, and by travelers and adventurers from Turkestan.

make a special excursion down the southern stump of the Great Wall to visit the quaint old city of Taiyuanfu, with its curious leaning pagoda (see page 128) dating from the Sung dynasty (960–1260 A. D.), an oriental counterpart of the Leaning Tower of Pisa.

At Taiyuanfu also may be seen the start of that great highway which crosses the Inner Loop at the Yenmen, or "Goose Gate," through which the hordes of Genghis Khan, turned back at Chuyungkwan, finally entered China, continues to the city of Soping, and from there, through the Shahukow, in the Outer Loop, winds away toward the plains—a true highway of adventure and romance.

THE YELLOW RIVER DIVIDES THE GREAT WALL

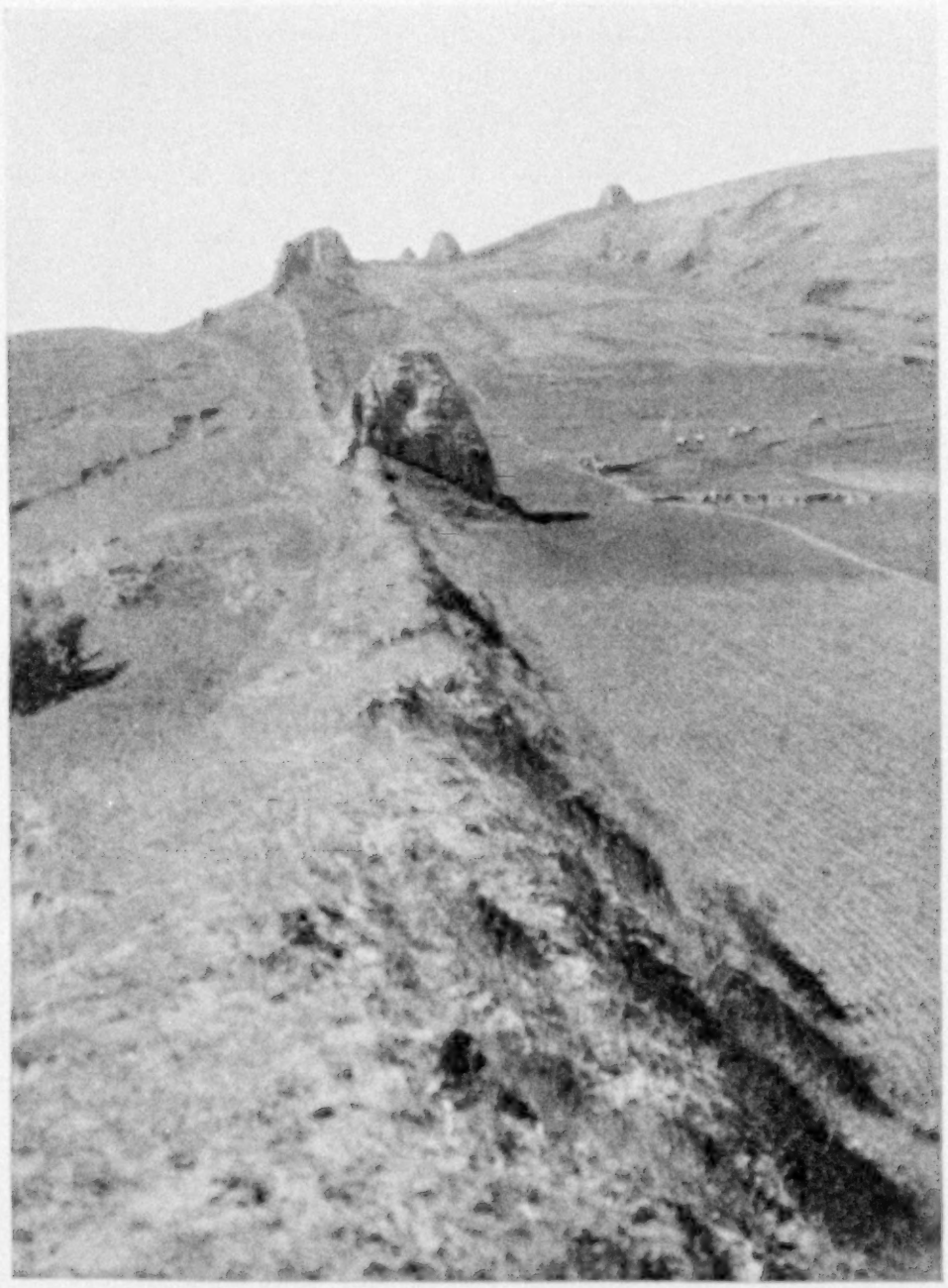
A little beyond Soping the two loops of the Great Wall unite near the Yellow River, which encircles the wild Ordos country. Roughly speaking, we may say that the Yellow River separates the Great Wall into two distinct sections, eastern and western.

Only the eastern has been described here, because this portion of the Barrier is the most characteristic of its original purpose and the best preserved.

This was a true defense rampart, intended to exclude foreign encroachment upon Chinese soil. As long as the danger from the north lasted, it was not only carefully guarded, but underwent substantial improvements at great cost and until a comparatively recent date.

The western section, beyond the Yellow River, differed not only in its construction, but in the very purpose for which it was intended. This was not a barrier intended to exclude the foreigner, but, on the contrary, a protecting rampart for the trade road between China and the Far West.

Recent discoveries have shown that under the great Han dynasty (206 B. C. to 220 A. D.) the Wall extended even



Photograph by R. E. Baber

THE GREAT WALL IN THE MOUNTAINOUS PROVINCE OF SHANSI

"Along the northern border of Shansi the Wall is made of clay, without battlements, and is only about five feet high." At many places the Long Rampart lies in ruins, often being no more than a ridge of stones and clay intersected by crumbling towers (see text, page 123).

farther than Chiayukwan, far into the deserts of central Asia.

This elaborate safeguard for foreign communications is all the more interesting to note, since the Chinese have always been credited with an exclusiveness which, as a matter of fact, was really inaugurated by the Ming dynasty.

The policy of the Mings is plainly shown in their neglect of the western part of the Great Wall and their architectural efforts to strengthen and adorn the eastern section, which protected the approaches to their capital—Peking; also in the building of subsidiary walls near Lanchowfu running toward the Tibetan marches.

There is little left of the great Barrier where it follows the southern border of the Ordos Desert, save an earth and gravel mound a few feet high, and once historic towers are now merely rubbish heaps. Its grandeur and glory end after the first 1,000 miles, though, shorn of its battlements, it meanders on via Lanchowfu, Liangchowfu, Kanchow, and Suchow to its end, beyond the last-named city, near the Chiayu fortress, on the frontier between Inner China and Sin-Kiang, or Eastern Turkestan.

There is little, if any, interest in following this crumbling mound, hastily thrown together, of materials collected on the spot by the builders, who made scarcely any effort to encase it in granite or protect or embellish it with parapets. The traveler here finds many difficulties without an adequate reward.

THE TRAVELER FACES MANY DISCOMFORTS WHILE STUDYING THE GREAT WALL

Even along the first 1,000 miles of its glory there is no royal road for those who would explore the Great Wall. Enthusiasm in unlimited quantities is needed—enthusiasm in spite of the discomforts of native inns, of fatigue from long hours of riding on donkey back on a hard pack-saddle, or walking along rough tracks. But here there are many interests to suit all tastes.

The scientist, the botanist, the archeologist, or simply the lover of natural

beauty, finds many pleasurable thrills along the way.

The storm-cloud effects of midsummer are beautiful and full of unexpected charm. Often the day dawns with a clear blue sky—an infinite space of softest azure—and at noon the heat waves shimmer from the rocks. Then suddenly on the horizon fleecy clouds bank up, followed by heavy black clouds. Soon the thunder is crashing over the peaks, jagged streaks of lightning fall like spears from the heavens, and there is a flood of rain. In a few minutes every little valley is a waterfall and every slope a madly foaming torrent.

Scarcely less lovely is the trip along the Wall in the early autumn season, when the shrubs have donned their brightest raiment and there is a riot of color throughout the valleys and on the parallel slopes of the mountains, when the winds have ceased even to whisper and a day of holy calm prevails.

But best of all the seasons is winter, when the bare, jagged mountain peaks over which the Wall passes are smoothed under a coverlet of snow. Then the rocks take new and strange forms under their white mantle; then the distant views of hills and valleys, ever deceptive in the rarefied atmosphere of North China, are brought unbelievably near. It seems almost as if on these clear, frosty days we could step from one watchtower to another.

A BOUNDARY BETWEEN TWO WORLDS

At all times and at all seasons the Great Wall gives the impression of being a boundary between two worlds—not only a natural boundary, but a racial boundary also.

"It is," says Geil, "a dividing line between two civilizations and two areas. . . . In space it cut off the herdsmen of the north from the tillers of the south. . . . Southward of the Barrier we find one type of culture; northward there is little but barbarism.

"The wave of true Chinese civilization rolled southward, engulfing all that it met on its way till it reached the boundary of the ocean. Thus all, from wall to water, owned the sway of the sons of Chin."

THE GREAT WALL WAS NEVER A DEPENDABLE BARRIER

As a practical measure of protection, the Great Wall was never really effective. China was overwhelmed again and again, in spite of it, by the huge racial movements of the Tatar hordes, which for 2,000 years devastated Asia and even troubled Europe from time to time; but it did prove valuable as a rampart against petty raids, and its moral effect on any but the greatest conquerors must have been tremendous.

Only a man with stout heart and tremendous military resources would dare attempt a passage of a barrier whose watchtowers in the accessible passes were only 100 yards apart and even in the remotest wilds were never more than a mile from one another.

Nowadays the idea of the Great Wall as a defensive fortification is entirely abandoned. It is left frankly undefended, though the gates at the passes are still closed at night as a measure of protection against local disturbances for the cities near them.

Not even a corporal's guard now paces the *terre-plein* for hundreds of miles.

But the simple people believe that Chin Shih Huang Ti's Rampart, stretched along the frontiers like a huge fossil dragon, protects China from evil influences.

Gradually crumbling to pieces, yet still majestic in its ruin, slipping down stone by stone into the valleys, the Monster, alas, seems to be losing his power to do even this.

INDEX FOR JULY-DECEMBER, 1922, VOLUME READY

Index for Volume XLII (July–December, 1922) of the National Geographic Magazine will be mailed to members upon request.

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FAIR FRISIANS OF LEEUWARDEN, HOLLAND

The European traveler encounters the old Frisian tongue not only in Holland, but in many "language districts" along the southwest coast of Denmark and in some of the coastal islands of that country.

THE BATTLE-LINE OF LANGUAGES IN WESTERN EUROPE

A Problem in Human Geography More Perplexing Than That of International Boundaries

By A. L. Guerard

MANY of The Geographic's readers, I am sure, have gone through the following delightful experience:

It is night; it is cold. The train pulls up at a little station which marks the boundary between two central European states. Out of your compartment you tumble, with bag and baggage—the easy-going days when a perfunctory glance sufficed to satisfy a *douanier* that you were not a professional smuggler have been swept away by the Great Storm.

Papers are scrutinized, your luggage opened and searched, with more efficiency than gentleness. A thick bundle of greasy notes changes hands. Hastily you pack your scattered belongings again; kneel on the bulging, gaping, recalcitrant suitcase; stuff into your pockets the odds and ends you had nearly forgotten, and hasten, grumbling, to the train, to resume your uneasy slumber.

There you may dream of a country where it is possible to travel for days, instead of hours, without having to face such barbarous and unnecessary discomfort.

THE TRIALS OF THE LINGUISTIC BORDER-LINE

Now, the ordeal of the flesh, when crossing the customs line between two European countries, is but the symbol of a worse ordeal, both of the flesh and of the spirit, when crossing that invisible and very real line, a linguistic boundary. When you reach a country where your speech no longer has currency, it is your *ideas* that have to be dumped out of their familiar container, your language. Then you must pick them up again in a jiffy, and wrap them somehow, anyhow, in a new container, of different size and shape—a foreign language.

No wonder if your most delicate thoughts look crumpled after going through such a process; if some that you cherished are left behind in the rush; and if you unwittingly appropriate others, not because they are desirable but because they happen to be right at hand.

This linguistic ordeal is one that many of us try to avoid, either by staying at home or by keeping to those well-traveled routes where, thank Heaven, "English is spoken and American understood."

We are all familiar with the story of Babel and the confusion of the tongues of men. But few people in America thoroughly realize what the curse of Babel means in terms of discomfort and even of danger.

Language remains the worst frontier in Europe, the most complicated, the most impassable, the hardest to adjust, the most fertile in conflicts and hatred.

A NEW LANGUAGE EVERY FEW MILES

We are accustomed to the broad lines upon which our Western civilization is built; from ocean to ocean and from pole to pole only three languages prevail: English, Spanish, and Portuguese. (The local survival of French in Quebec and in some of the West Indies hardly affects the general truth of this statement.)

In northern Asia and eastern Europe, from Vladivostok to Brest-Litovsk, and from Archangel to Sevastopol, a single master key opens the civilization of 150,000,000 men. But in western Europe (which, for the purpose of this article, we shall define as the whole of Europe minus Russia) the geographical domain of even the major languages is, according to our American ideas, pitifully small.

The largest, the area of German speech, including the present Republic, German Austria, parts of Czechoslovakia and Switzerland, and a fringe in Belgium, France, Italy, and Poland, is smaller than our single State of Texas.

What are 200 miles to the modern

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A TEA-PARTY ON THE ISLAND OF MARKEN, IN THE ZUYDER ZÉE

Owing to the fact that the quaint island of Marken is visited annually by thousands of Americans, many of the Dutch children have become familiar with the English tongue.

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THE VILLAGE SCHOOL OF STAPHORST, OVERIJSEL, HOLLAND

The language boundaries in western Europe are so numerous and often so close together that it is not unusual for the school child to have to master from three to four languages in addition to his native tongue.

traveler? Two hundred miles is the distance, as the crow flies, from New York to Boston, Syracuse, or Washington—a matter of less than six hours by fast train. Soon we shall think of it as a two-hour ride in a commercial airplane. Now, if with any one of the European capitals as a center (with the exception of Rome) you draw a circle 200 miles in radius, you will find that at least four different languages are reached. Such a circle forms very restricted bounds for the scientist or business man.

ONE'S LANGUAGE MAKES HIM AN OBJECT OF SUSPICION

And it is indeed a prison. Beyond its wall reign incomprehension, diffidence, hatred. If a man lands on the wrong side of the language boundary, the very accent of his speech marks him for a foreigner, frequently for an enemy. He is fair game for the crook and an object of suspicion to the police.

The simplest transactions of practical life become a series of pitfalls. The writer once had to rescue a number of doughboys of the American Expeditionary Forces who had wandered away from their outfit with no French at their command except "toot sweet."

The telephone turns into a mockery. What is the use of being connected with Berlin and Rome if you can't speak German or Italian? The telephone is pitiless for strangers whose pronunciation is imperfect. It is not always easy to get the right number even in your own language, but with the added handicap of a foreign accent, the case is well-nigh hopeless.

No doubt that very uncertainty adds to the romance of life. You try to order

Photograph by Marie Hagenaers

FAMILY OF LACE-MAKERS, BRUGES, BELGIUM

Bruges is a Flemish city and its inhabitants speak Flemish, a German dialect, in contrast to the Walloons of southern Belgium, who speak French. It is estimated that five-eighths of the people of Belgium speak Flemish, but French is the language of the government, of the army, of most of the newspapers, and of public traffic.

a drink in a restaurant, and the waiter brings you delicious fish. You follow directions that should lead to Kensington Museum, and finally reach the Angel, Islington, or the Whitechapel Road. You ring up a friend, and are connected with a total stranger who may be much more interesting—if only you could understand him.

It is thrilling, and should appeal to a G. K. Chesterton. But if you happen to have some definite purpose, such adventures will soon cease to tickle your sense of humor. Once more, you will sigh for "God's own country," where people can talk, instead of jabbering.

Western Europe—by which we mean, once more, the whole of Europe minus Russia—is considerably smaller in area than the United States, and it rejoices in the possession of some 40 languages.

By languages we mean, not local *patois*,

Photograph by Clifton Adams

PARISIENNES IN ALSACE-LORRAINE COSTUME SELLING SOUVENIRS TO AMERICANS

A feature of the Alsatian costume is the huge bow of black ribbon used as a headdress, its size varying according to the locality. There are probably fifty styles of costume in these redeemed provinces of France, where "populations of different speech jostle one another in the same territory."

which are innumerable, but only those dialects which are advancing definite political and cultural claims to recognition; those that are actually taught in schools, and in which books and papers are printed; those which, even though they are not officially established, are strong enough to create a "question"; those for the sake of which men are willing to fight or to be persecuted.

It may be objected that we are exaggerating the evil; that the linguistic map of Europe is not so complex after all. If there are 40-odd languages in Europe, and more *patois* than are dreamt of in our philology, four-fifths of the population speak languages that belong to one of the three main groups—Slavic, Romanic, and Germanic.

True enough. These kinships among languages do facilitate comprehension. I am informed by a Bulgarian scholar (Dr. R. A. Tsanoff) that Serbs and Bulgars could understand one another easily enough, if only they wanted to, which, unfortunately, is not the case; and that Bulgarian students soon found themselves at home in the Czech university of Prague. There is no doubt that German comes more easily to a Scandinavian or to a Dutchman than to a Frenchman; and the Italians in Buenos Aires soon master the Spanish language.

RELATED LANGUAGES ARE OFTEN NOT ON "SPEAKING TERMS"

But it would be wise not to lay too much stress on these theoretical language affinities. Many languages are "related, but not on speaking terms." Two of the most important languages in Europe have developed in such a way as to become strangers in their own families.

English bears only a distant likeness to the other Germanic tongues. It has really become, in syntax and vocabulary, a hybrid, as Max Müller maintained. Standard French is Northern French (Langue d'Oil, or Francian), which has moved so

Photograph by Crété

GIRLS FROM ST. POL DE LÉON DISTRICT, FRANCE

Many French women proclaim their town and province by means of their caps. Brittany is rich in striking types.

far from its Latin origins that many problems of etymology remain obscure even to-day. It is impossible for "Latin" cousins from Paris, Madrid, and Rome to understand each other without serious study.

We may therefore stick by our number of 40 as a fair representation of the European situation. If we err, it is rather on the side of optimism.

Italian, for instance, is counted as only one language, because there are no Italian dialects that are advancing political claims and creating a "question." But Italian dialects still have a very real existence, and a man who knows only standard Italian will not find it easy to understand a conversation in the streets of Venice or Naples.

But even if we admit that language affinities relieve the situation to some extent, they are far from helping us out of our worst difficulties. The former Hapsburg Empire, with an area barely one-fifteenth of that of the United States, had German, three groups of Slavic languages, two Romance languages, and Magyar!

To learn a related language is no child's play, but to learn a language totally unrelated to your own is a tremendous undertaking. It involves the acquisition of thousands of words which have little in common with our native vocabulary, and the complete recasting of our habits of thought.

It is not surprising, therefore, that people should give up the attempt, and that, century after century, a French village should stand a few miles away from a German village, with a surprisingly small amount of infiltration from one language into the other.

MIXED POPULATIONS WILL NOT MIX

We have so far insisted upon the number of languages spoken in western Europe, and the small area allotted even to the more important of these. But confusion grows worse confounded when, instead of forming a patchwork or mosaic of self-contained elements, populations of different speech jostle one another in the same territory. No map can do full

Photograph by Crété

HARVESTING ARTICHOKES BETWEEN ST. POL DE LÉON AND ROSCOFF, FRANCE

Not all Frenchmen speak French. There are, for example, the Bretons, who are of Celtic origin and who derive their name from ancestors who emigrated from Great Britain to escape the Angles and Saxons in the fifth century.

justice to such a situation, the result of conquest, migration, or infiltration.

Frequently the dominant population belongs to one linguistic group, the common people to another. Thus, the Poles, who were held down as a subject majority in Posen, found themselves a ruling minority in the east and southeast of their ancient kingdom. Persecuted by the Prussians, they lorded it in their turn—and with no waste of gentleness—over White Russians, Lithuanians, and Ruthenians.

The cases of Transylvania and the Banat of Temesvar are singularly complicated. When the receding Turkish flood left Transylvania in Hungarian hands, a Rumanian-speaking peasant population, unorganized and illiterate, was dominated by Magyar *Szeklers*—a significant word, for it means frontier guardsmen; and among Rumanians and Szeklers live solid colonies of Saxons, one of which may have been led thither by the Pied Piper of Hamelin!

In the Banat, Rumanians, Serbians, Germans, and Magyars are hopelessly entangled.

SALONIKI IS A BATTLE-FIELD OF RIVAL TONGUES

Perhaps the most extreme case is provided by the city of Saloniki and its immediate hinterland in Macedonia. The place was Turkish for centuries, and is now under Greek rule; but the languages of its present and of its former masters are used only by minorities. At its very gates are found Macedonian peasants whose Slavic speech shades off imperceptibly from Serb to Bulgar, thus providing a battle-field for philologists and diplomats, a "question" drenched in blood and printer's ink!

Rumanian (Kutzo-Wlach) and Albanian tribes hover near, and the chief element in the city is Jewish. But those Jews, exiled from Spain ages ago, still speak a Spanish jargon, instead of the Germanized Yiddish of most of their co-religionists. No wonder that there, as in

YOUNG CITIZENS OF CHALONS-SUR-MARNE

The plains in the vicinity of Chalons-sur-Marne have been a battle-ground of nations since the beginning of the Christian era. It was here that one of the decisive contests of the world was fought, when the Romans and their allies defeated Attila and his Huns and saved western Europe from the Mongols.

Constantinople, the current language should be none of these conflicting tongues, but French, in which the best schools are conducted, and the most widely read papers are published.

EUROPEAN PROBLEMS DIFFERENT FROM AMERICAN "MELTING POT"

"Well," you may say, "Saloniki 'has nothing on' our leading American cities, and particularly the one orifice of our melting pot, New York. There also you will find the most heterogeneous agglomeration—all the dialects of eastern and western Europe, with baseball slang, Mr. Mencken's *American,* and Chinatown thrown in for good measure. Yet no one worries seriously over our language difficulty. It is adjusting itself all the time."

But the comparison between Europe and America is wide of the mark. Europe may be a witches' caldron; it is not a melting pot.

Our immigrants of foreign speech—like the writer—came of their own accord into a land of promise. The country was strongly organized, and they found themselves, at any one moment, a pulverized minority. Had they attempted to challenge the supremacy of the national language their defeat would have been certain.

But there was no reason for them to make such an attempt. There was, on the contrary, every inducement for them to seek assimilation. There was nothing to hinder, nothing in the principles or annals of America that would jar upon their own

Photograph by A. Frankl

A COSTUME COMPETITION AT ULM, SOUTH GERMANY

The jury is examining the aprons and skirts of the young Bavarian girls to see whether the costumes are strictly original. Ulm is noted in the history of German literature as the spot where the Meistersinger lingered longest, preserving without text and without notes the traditional lore of their craft.

habits of thought, no new dynasty to serve, no bitterness of former wars to forget.

They were only expected to behave decently in a trusting and hospitable country, and to cherish the ideal of liberty under law. Therefore, assimilation is proceeding so fast that in most cases the second generation does not know the language of its forebears.

Very different indeed is the situation of a compact group of men, rooted in the soil, having their own traditional rights, aspirations, and organizations, a cohesive force binding land, people, language, church, and school together. Such groups, though small, are almost ineradicable.

French civilization is credited with a wonderful "contagious power." Paris takes a Brazza, a Novicow, a Psichari, a Papadiamantopoulos (Jean Moréas), a Brancovan (Comtesse de Noailles), and

Photograph by A. Frankl

YOUNG BAVARIANS OF ALGAU WEARING THE ANCIENT COSTUME

While the Bavarian German is softer in accent than the Prussian German, it is not such minor divergences that constitute the language problem in Europe, where there are forty-odd distinct tongues spoken in an area smaller than that of the United States (see page 148).

Photograph by A. Frankl

GIRLS OF THE SPREEWALD DISTRICT, NEAR BERLIN

These people are Wends (Slavs), whose home is a wooded, marshy district, intersected by a network of two hundred branches of the river Spree. In summer the chief means of communication between the various villages is by water, and in winter over the ice.

Photograph by A. Frankl

GERMAN STUDENTS OFF FOR A VACATION WALKING TOUR THROUGH THE BLACK FOREST

UM

A DANCE IN HESSE PROVINCE, GERMANY

The area in which the German language prevails is larger than that of any other tongue in western Europe. It includes not only the present German Republic, but German Austria, fringes of Italy, France, Belgium, and Poland, and parts of Czechoslovakia and Switzerland—but, in all, an area smaller than our State of Texas.

Photograph by Maynard Owen Williams

BELLES OF CZECHOSLOVAKIA

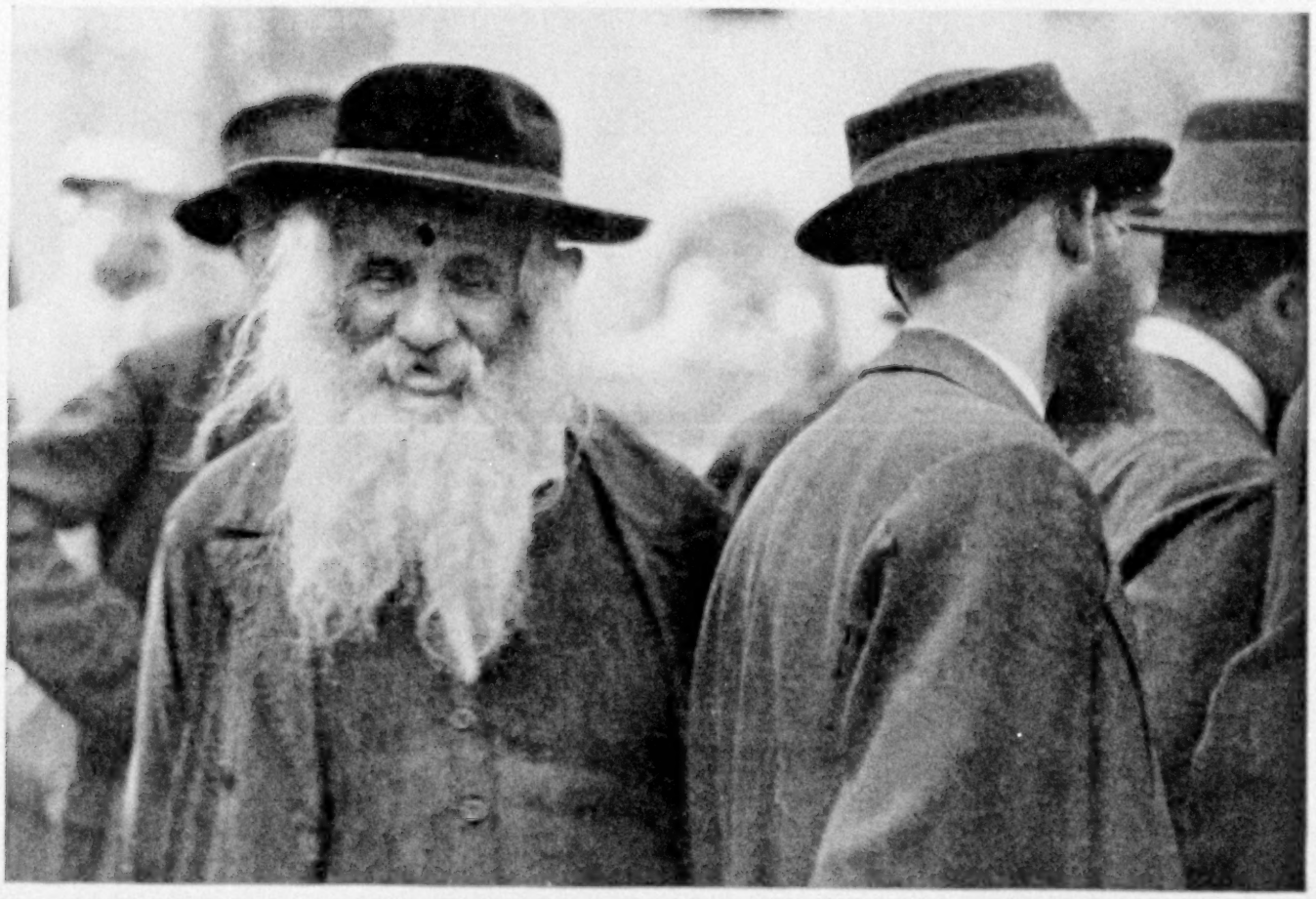
The native costumes of Czechoslovakia are a never-ending delight. Each little village has its distinctive dress, which runs the gamut of color. The woman in the center is a matron and wears the Cicmamy costume, one of the most beautiful to be found in this country. The Czech language has remained the organ of the common people through many years of tribulations and has produced a wealth of early poetry found among no other Slavs.

turns them into ardent Frenchmen in less than a decade. But, in spite of this magnetic quality, in spite of a centralizing policy which is meant to grind minorities out of existence, the historical groups resist assimilation with a tenacity which is purely passive, and yet amazing.

French is driving back Breton, Flemish, and Basque, no doubt, but at a rate which must be counted in terms of centuries, not of years.

Similarly, our triumphant North American civilization finds it surprisingly difficult to absorb blocks of alien population when they are compact, and not disintegrated; when they have their own local traditions and are imbedded deep in the soil. Quebec will remain, apparently for all time, an impregnable French island in an Anglo-Saxon world.

After three-quarters of a century, there are thousands upon thousands of New Mexicans who have retained their habits and their language. Even the handful of French colonists in Louisiana, long outnumbered, ruined by the Civil War, have managed to hold their own for 120 years.



Photograph by Maynard Owen Williams

SEMITIC TYPES IN MUNKACS, CZECHOSLOVAKIA

In reviving the Czech language as a vehicle of culture the Bohemians have erected a new barrier between themselves and the rest of the world (see text, page 166).

These examples give us the true European note. Transylvania, for instance, is not a melting pot like the Bowery; the minorities cling more passionately to their separate existence than even the French in Quebec. A Magyar, who on this side would have been assimilated in five years, will in Kolozsvár live and die a Magyar, transmitting to his sons the pride of the Magyar name. Once more, national elements must be disintegrated before they can be fused.

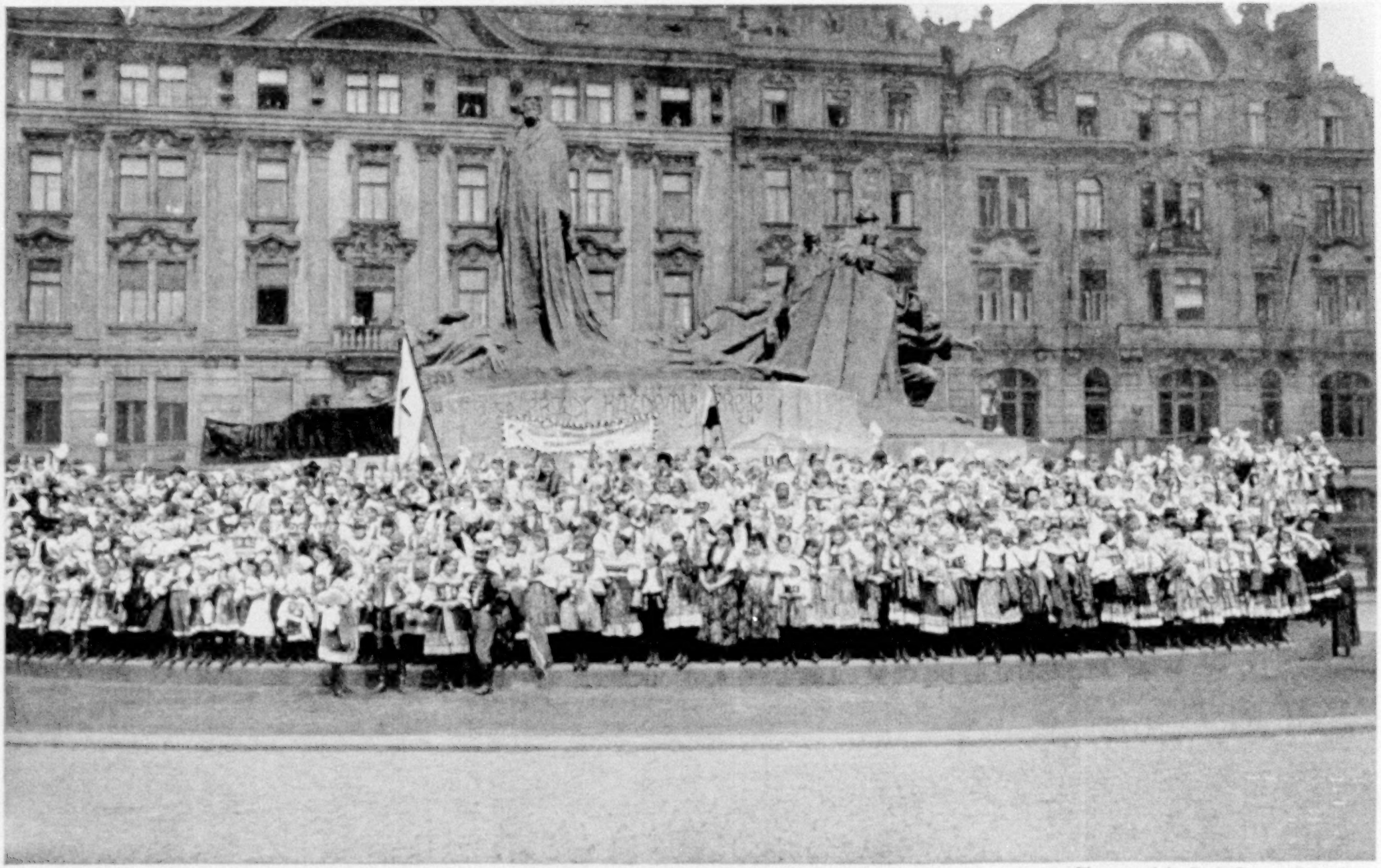
ASSIMILATION CHECKED BY THE TREATIES OF 1919-1920

Our chief instrument of Americanization has been the little red schoolhouse. Our mighty nation was kneaded together by the hands of the "schoolmarm." But there is nothing in Europe that exactly corresponds to that unifying factor. The schools teach the national languages, and the best they could achieve would be to bring the linguistic map of Europe into harmony with the political map.

This would be a simplification, but it would still leave some twenty nations with twenty languages. We are very far from the goal.

But even this process of simplification has been made almost impossible by the provisions of the treaties of 1919-1920. Ethnic groups separated from the main body of their people were guaranteed the free use of their language in school, church, and local administration. No doubt the central government retains the right of making the study of the official tongue compulsory in all schools, but it will remain a foreign idiom. Most children will not progress any further in it than our sophomores in French or German. The smaller languages, in minor countries, in autonomous provinces, in enclaves, are now entrenched in international law.

The policy was undoubtedly a well-meaning one; we had protested loud enough against forcible Prussification or Russification, and we did not want to see forcible Rumanization or Polanization take their place. The perpetuation of the European Babel was the lesser of the two evils.



Photograph by Rudo Bruner-Dvorak

THE HUSS MONUMENT IN THE PUBLIC SQUARE OF PRAGUE, CZECHOSLOVAKIA

"Golden Prague," as the Czechs love to call it, has had a stirring history. This monument to the Bohemian national hero, John Huss, was unveiled in 1915, on the five-hundredth anniversary of his death in the city of Constance.

Photograph by Nevin O. Winter

PEASANT TYPES OF POLAND

In the days of its political eclipse, Poland was partitioned among Austria, Germany, and Russia, but Polish as a language of literature and of culture was never subordinated, as were the tongues of other oppressed nationalities of Europe.

Photograph by Erdelyi

A HUNGARIAN BELLE OF KARCZAG, EAST OF BUDAPEST

This is one of a bewildering variety of costumes to be found among the Hungarian peoples. They are all exquisitely embroidered in striking colors.

Minor languages cannot be killed, and refuse to commit suicide. But are there not forces deeper than man-made law, stronger than local pride or customs, that are making for increasing unity?

THE LANGUAGE BARRIERS HOLD DESPITE ECONOMIC NEEDS

As a result of scientific discovery, the Continent is shrinking under our eyes. The human voice can be carried in a few seconds, the human body in a few hours, all over central Europe. The economic interdependence of all European countries is no longer denied, even by the most hidebound protectionist. It would seem that under the impact of such forces, international barriers would crumble away, including the most definite and lasting of them all, the barrier of speech.

The experience of the last hundred years is not reassuring. The nineteenth century was an epoch of scientific, industrial, and democratic progress, but also one of riotous nationalism; and there is no sign that national exclusiveness and

Photograph by Kilophot

OLD-STYLE DRESS FROM LAVANT TAL, AUSTRIA

This valley is near Vienna, and its smiling natives share the genial dispositions for which the Viennese are noted.

Photograph by Kilophot

A FIGURE IN THE MILLERS' DANCE, CALLED "THE STAR," IN OETZ TAL, AUSTRIA

It is in districts such as this, far removed from metropolitan centers, that the *patois* of the peasant is cherished and persists for centuries as the language of the home, of legend, and of prayer.

XUM

Photograph by A. Frankl

HUNGARIAN COUNTESSES DISPLAYING NATIVE COSTUMES ON ST. STEPHEN'S DAY: BUDAPEST

The Hungarian capital is the Mecca of Magyar aristocracy and the cosmopolitan center of Hungarian national life. Its architectural beauty is unsurpassed.

Photograph by Maynard Owen Williams

BULGARIAN PEASANTS AT A VILLAGE MARKET

Their melons spread on aprons at their feet, these women improve the time by spinning while awaiting a customer. They do not wear the native picturesque costume except on gala occasions. Bulgarian is called "at once the most ancient and most modern" of Slavic languages. The grammar shows modern tendencies, but the linguistic groundwork is in close affinity with the oldest written Slavic dialect, that of the church.

pride have in the least abated in the twentieth century.

CRAVING OF ETHNIC GROUPS FOR RECOGNITION MULTIPLIED LANGUAGES

Many nations have revived and struggled for recognition, for the last hundred years; and every little group, as soon as it acquired consciousness, became loudly assertive and exclusive. Sinn Fein could be the motto of all the national revivals in recent history.

Nationalism has no doubt been a great power for good, but it has also exacted a heavy price In reviving the Czech language as a vehicle of culture, the Bohemians erected a new barrier between themselves and the rest of the world. Catalonia is the most active part of Spain, and the Catalan language has a noble tradition; yet it seems a pity that this sturdy, progressive population should not be satisfied with Castilian, a language of world-wide availability.

The Irish Free State will not let the Irish language fade away; it may even require every loyal Irishman to burden his mind with that venerable and impracticable instrument.

In 1830, French was practically the sole culture language of all the Belgians. But the Flemings would have no peace until they had secured for their Dutch dialect full equality with French, thus creating a linguistic barbed-wire fence through a country about as large as Maryland and Delaware together.

France had repeatedly threatened the independence of Belgium, and Flemish belongs to a different family from French, so there is some justification in the hostility of the Flemings to the supremacy of the French language.

These reasons do not exist in the case of Rumanian. There was no Rumanian literature until half a century ago. French was the current language of all educated people in Rumania; only French was

Photograph by Erdelyi

A SHEPHERD OF THE HUNGARIAN PLAINS

The Magyars, the dominant race of Hungary, are a virile people, who were, for more than a century, the buckler of Christendom against the Ottoman Turks. The sleeves of this shepherd's coat are never used, the garment being placed loosely over the shoulders and fastened in front by a short leather strap.

heard in the salons and theaters of Bucharest, and even in the corridors of the National Parliament.

French and Rumanian are cognate languages, and there is not the slightest danger that France would ever threaten the political or economic independence of Rumania. It seems as if the wise thing to do would have been frankly to adopt French as the official language of the new state.

NORWAY SETS UP A NEW NATIONAL LANGUAGE

But that was incompatible with the fierce pride of a new nationality, which must have all the appurtenances of its dignity—a dynasty, a diplomacy, an army, a navy, a language. So, without any feeling of hostility toward France, patriotic Rumanians began deriding and even mishandling the *Bonjouristes,* as they called their Frenchified aristocracy.

One of the most curious instances of this craving for national differentiation, this "Ourselves Alone!" in the linguistic domain, is provided by the Norwegians. It seems bad enough that Scandinavian, spoken in five countries (Sweden, Norway, Denmark, Finland, and Iceland), should be divided into at least two branches, which a peculiar accentuation makes noticeably different.

We might desire to see the rise of a Pan-Scandinavian, overriding local idioms, in the same way as the King's English is superseding provincial forms. But Norway has chosen another path. She was getting along well enough with Danish as her official language, when some patriot discovered that the use of Danish was the badge of previous servitude. So, against

Photograph by A. Frankl

THREE WOMEN OF THE UPPER CLASS AT SCUTARI, ALBANIA

The Albanians are thought to be the most ancient people of southeastern Europe. Their vocabulary is cumbered with many Greek, Latin, Italian, Slavic, and Turkish words, but their grammar is their own.

XUM

Photograph by A. Frankl

NINETY SQUARE FEET OF ALBANIAN FEMININE TROUSERS

The costumes of Albanian women are varied and picturesque. The Turkish trouser is a voluminous feature of most of the styles.

Photograph from "Le Tour Du Monde"

A DANCE OF SPANISH GIPSIES

The language of these wanderers (see also illustration, page 172) is a primitive Indo-European, now spoken by no other peoples and contained in no book or manuscript.

Danish, or Riksmaal, a new "national" tongue was set up, the Landsmaal. This, although it calls itself the Norwegian Popular Language, is an artificial combination, a composite dialect, on the basis of old Norse peasant *patois*. It is not spoken spontaneously anywhere, but it is taught, it is gaining ground, and it may become the sole medium of expression in Norway.

Thus an obstacle deeper than the Skagerrack will be created between two sister countries which, even combined, would form too small a culture group.

NATIONAL PRIDE FIERCELY DEFENDS LINGUISTIC BOUNDARIES

Mind you, we do not mean to deride the unpractical, the quixotic attachment of each nation to its dialect, even though it be spoken only by a mere handful of men. Not only is the sentiment respectable in itself but, from the point of view of the artist, it is justifiable.

Local dialects alone are truly racy of the soil; they should provide a more exquisitely attuned instrument than the semi-artificial languages imposed by a central government. The world is richer for the Scotch of Burns, the Platt-Deutsch of Fritz Reuter, the Provençal of Mistral. The value of a violin is not measured by the volume of sound it can give out; such a test is legitimate only in the case of fog-horns.

The æsthetic value of a language depends upon the subtle harmony between the author and his public. The more intimate the circle, the more perfect the harmony.

But there are two aspects to a language. It is an instrument of art; it is also a business tool. From the latter point of view, the value of a language depends chiefly upon its diffusion, just as an imperfect telephone system with a large list of subscribers is of more service than an ideal apparatus with only two stations.

MAN IS NOT PRIMARILY AN ECONOMICAL CREATURE

So the tendency toward a concentration of languages is checked by the pride of the nationalist and the scruples of the poet.

"Natural evolution" might reduce major languages to four—English, French, German, and Spanish; it might even lead to the survival of English alone, possibly in a simplified form. But man is not a *homo economicus*, whose sole aim is to get goods or ideas from the cheapest sources and sell them in the highest market. Man is an absurd and noble compound of traditions and passions.

One of these traditions is to cling to his native speech; one of these passions is that his language, like his government or his flag, should acknowledge the supremacy of no foreign authority.

There is nothing less "natural" than a line of frontier poles across a level country or at right angles with a navigable river. Winds, waters, plants, and birds ignore such "foolish" separations. But men will die rather than see such a line moved a few miles back; and the linguistic boundary is defended as fiercely as the political one.

NEUTRAL LANGUAGE NEEDED FOR INTERNATIONAL RELATIONS

Such is the situation in Europe: some 40 languages having secured, or striving for, recognition. That situation is manifestly out of harmony with modern needs. The smaller nations in Europe can no longer live in isolation, as yet smaller districts could live before the industrial era.

Even France, now the largest nation of western Europe and the most nearly self-sufficient, recognizes the need of close international coöperation. The life of Europe cannot be normal until it is organized, like that of North America, upon a continental scale.

But the subjugation of all states by one state, of all languages by one language, is a dream, and certainly not a beautiful dream. The passionate pride of historical groups, great or small, must be respected.

Is there no way out of this contradiction? Yes: the adoption of a neutral auxiliary language for international relations.

The problem is pressing and will not be denied. The lack of a common medium creates material obstacles and perpetuates historical misunderstandings. The "unspeakable" enemy is the enemy with whom we cannot talk.

Photograph by Dr. Franz Stoedtner

MYSTERIOUS NOMADS OF THE WORLD

The Gipsies first appeared in western Europe in 1417, but no tradition exists as to how they arrived or whence they came. Many Rumanian, Serbian, and Bulgarian ballads are derived from these wandering troubadours, and Liszt ascribes to them "the origin of Hungarian national music."

Whenever people from different countries come together—and come together they must, with increasing frequency—they have to decide upon a method of intercourse. They may decide upon several languages, with translations *ad infinitum;* they may restrict themselves to a couple, as in present-day diplomacy; but they have, first of all, to face the language question. For them, it is not, as many Americans think, a curiosity, a fad, a Utopia; it is an immediate need.

Any one who has attended an international gathering in Europe knows how tedious the present method is. Before the war, as many as five languages were officially recognized: English, French, German, Italian, and the language of the country in which the meeting was held. Speeches were repeated five times—four

times by interpreters, who, even if they were wonderfully proficient in their difficult art, were, as a rule, not thoroughly acquainted with the subjects they were treating.

Thought had thus to go, without any time for reflection or correction, through the imperfect medium of the interpreters' brains. The writer has frequently acted as interpreter, and he knows! Some of the translations were given at second-hand, from previous translations. A constant hubbub of conversation arose from those in the audience who could not understand the speaker.

Photograph by Capt. Alexander Edouart

A STURDY MONTENEGRIN TOILER

This woman, whose once independent kingdom has been merged into the new State of Jugo-Slavia, is wearing rawhide sandals. To her load of hay she has tied her leather shoes, which she considers too valuable to wear except on the roughest roads.

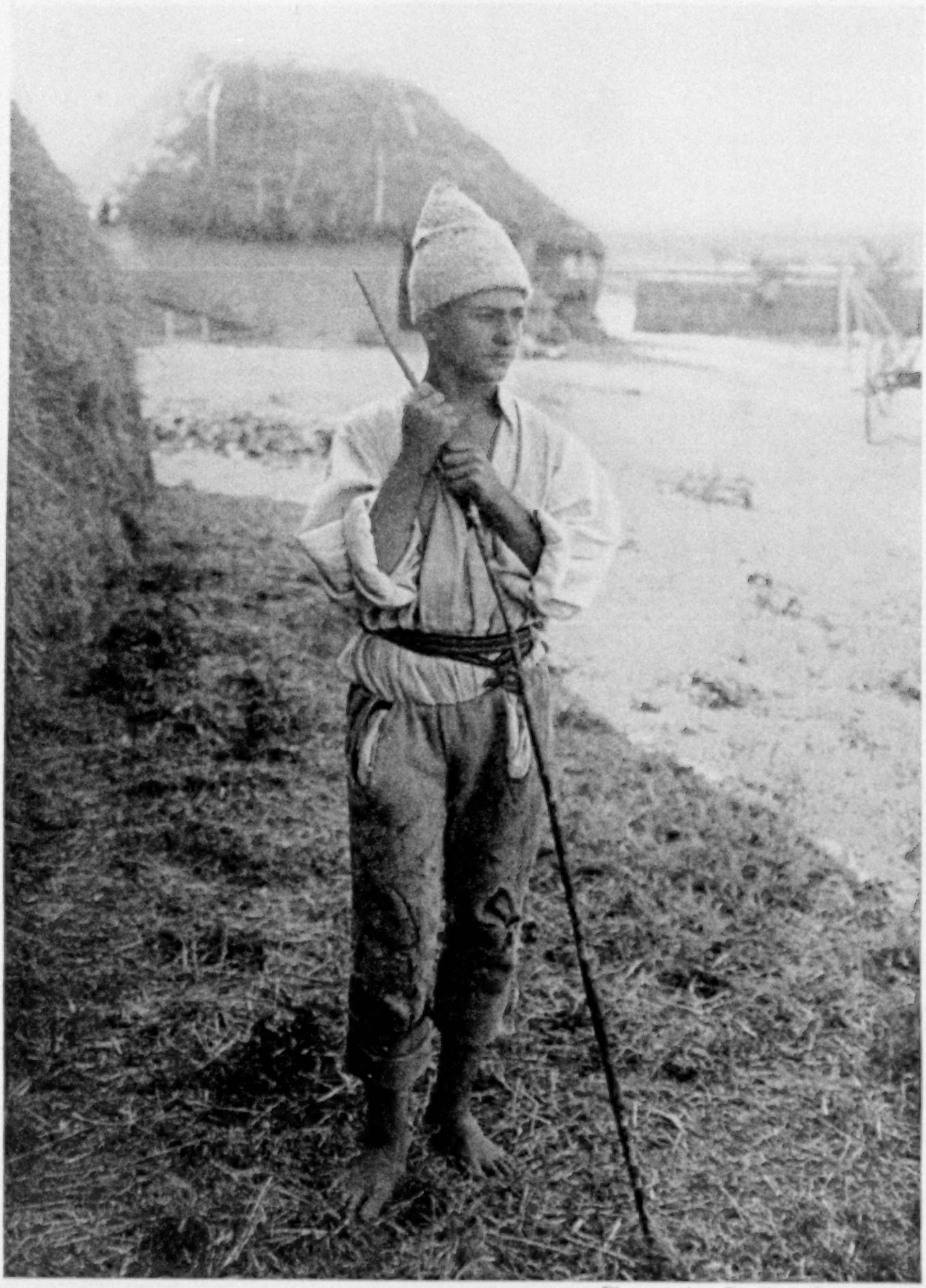
THE INTERNATIONAL LANGUAGE MOVEMENT

It is a sign of the profound need for international organization that, in spite of this tremendous language handicap, international gatherings, diplomatic, scientific, economic, religious, social, are being held with increasing frequency.

That is why the agencies which, slowly and painfully enough, are attempting to evolve order out of the European chaos are compelled to take the keenest interest in the international language problem. They are wise in not committing themselves to any one particular scheme; they are only gathering materials for a solution, and expressing their belief that a prompt and definite solution is desirable.

The World Congress of International Societies (Brussels, 1920), the Paris Chamber of Commerce, many members of the French Institute, the Congress of Red Cross Societies, the British, French, and American Associations for the Advancement of Science, have endorsed the idea. The Finnish Parliament has voted a subsidy in favor of the movement; Sweden has delegated a committee, which includes her Minister of Public Education, to urge the matter upon the League of Nations.

There is at Bern a Union for the Creation of an International Language Bureau. The International Research Council has appointed a committee, of which



Photograph by Dr. Franz Stoedtner

A WALLACHIAN SHEPHERD OF COZEA ALI, RUMANIA

The Wallachians are the only nomads found in the Balkans except Gipsies. Their lives are simple, solitary, and so essentially pastoral that their very name, Vlachs or Wallachs, is sometimes a synonym for "shepherd." The speech of the Rumanians is derived from the "rustic" Latin spoken by the Roman colonists of Moesia and Dacia.

Photograph by Dr. Franz Stoedtner

DRIVING A BARGAIN IN ONIONS: RUMANIA

Surrounded by powerful Hungarian and Slavic peoples, separated from Italy and all things Italian by 500 miles of distance and 1,600 years of time, the Rumanians are, nevertheless, "a people compact and homogeneous, whose features, language, monuments, customs, and very name show its Italian origin."

Photograph from Keystone View Company

A COUNTRY SCENE IN LATVIA

The Letts resemble their neighbors, the Lithuanians, in occupations and hardships of life, but are a distinct race. Until the World War, they had no thought of a national existence. They are an imaginative people, with an immense collection of folksongs and legends.

XUM

© Dr. Orrin S. Wightman

SOLDIERS IN ODESSA HAVING A FREE RIDE ON THE STREET-CAR

The Little Russians, or Ukrainians, number about 30,000,000. In 1320 the country was conquered and annexed by the Poles, who called it Ukraine, or "barrier" against the Tatars. Odessa dates from 1794 and owes its existence to Catherine the Great, whose purpose was to establish a strong city near Constantinople.

Photograph by Borg Mesch

A LAPP MOTHER WITH HER BABY

The Lapp "komsin," or cradle, is hollowed from the trunk of a tree. When a child is born a reindeer is set apart for him, which, with its progeny, forms the foundation of his future fortunes, and he can never be wholly without property. The Lapps are the most round-headed people in Europe.

Photograph by Jan Bulhak

YOUTHFUL LITHUANIAN TYPES AT VILNA

"In the eyes of the ethnologist, Lithuanian is the most important language of Europe." It is allied to the western branches of Slavic, resembles Latin more than it does Celtic or German, and is most like Sanskrit.

© Elmendorf

ACQUIRING THE "GIFT O'GAB"

The celebrated Blarney Stone was, according to legend, endowed by a witch with the power of imparting to any one who kissed it a fluent and persuasive tongue. Iron braces support it in the wall of the tower of Castle Blarney, near Cork, Ireland. Though the feat of kissing it is difficult of accomplishment, the stone is worn and polished by thousands of lips.

Photograph by A. W. Cutler

JAUNTING TO MARKET IN COUNTY GALWAY, IRELAND

The classic language of the Celts is fast yielding to the English tongue. Spoken in the middle of the last century by more than half the people, it is now used by less than one-seventh of the citizens of the Irish Free State.

an American, Dr. Cottrell, is chairman. At the request of thirteen members of the Assembly of the League of Nations, the Undersecretary General of the League, Dr. Nitobe, has prepared a report upon the present condition of the problem.

An auxiliary language is needed to make communications easy among those teeming millions who, whether they like it or not, are all members of one great economic society of nations. It will respect the independence and the pride of all existing dialects; it will not abolish, but transcend, frontiers. It will be the symbol of the new industrial and democratic civilization, which cannot be forever bound by the capricious historical lines of another age.

Every *patois* will remain, as long as men cherish it, the language of the home, of poetry, and of prayer. But by the side of the local language there is room for a simple, convenient, neutral instrument, common to all, through which men will realize that the stranger may be a fellow-worker and a friend.

In our splendid western isolation we are apt to misunderstand the bitterness of the need for an international language in Europe, and to ignore or belittle the efforts made in that direction. It is a practical problem in human geography which deserves to enlist our sympathy.

Photograph by A. W. Cutler

A SHEPHERD FROM THE TOE OF ITALY'S BOOT

Though there are now few visitors to Calabria, this southernmost province of Italy proper has had many stirring events of history connected with it. Scylla was a terror to Ulysses; it lay in the path of Garibaldi's triumphal march to Naples from Sicily; earthquakes often shatter the homes of its people, and archeologists still find it a treasure-trove.

Photograph by A. W. Cutler

SUCH TYPES AS AN ARTIST SEEKS

Many of the thriftiest citizens of Calabria have emigrated from its low, sandy plains and unhealthy marshes and have come to America. This region of Italy was once a notorious brigand retreat.

Photograph by A. W. Cutler

BEFORE THE CATHEDRAL OF ST. ANDREW: AMALFI

The magnificent coastal scenery in the vicinity of Amalfi makes this once independent city republic a show-place of the Mediterranean. The bronze doors of its cathedral were cast in Constantinople in the same year that William the Conqueror landed in England.

Photograph by A. W. Cutler

CALABRIAN PEASANTS AT SARACENA

Many old customs, proverbs, and superstitions still survive in Calabria and all southern Italy. When a girl child is born to a peasant he immediately plants a row of poplar trees, which will be large enough to cut down for her dowry when she is seventeen.

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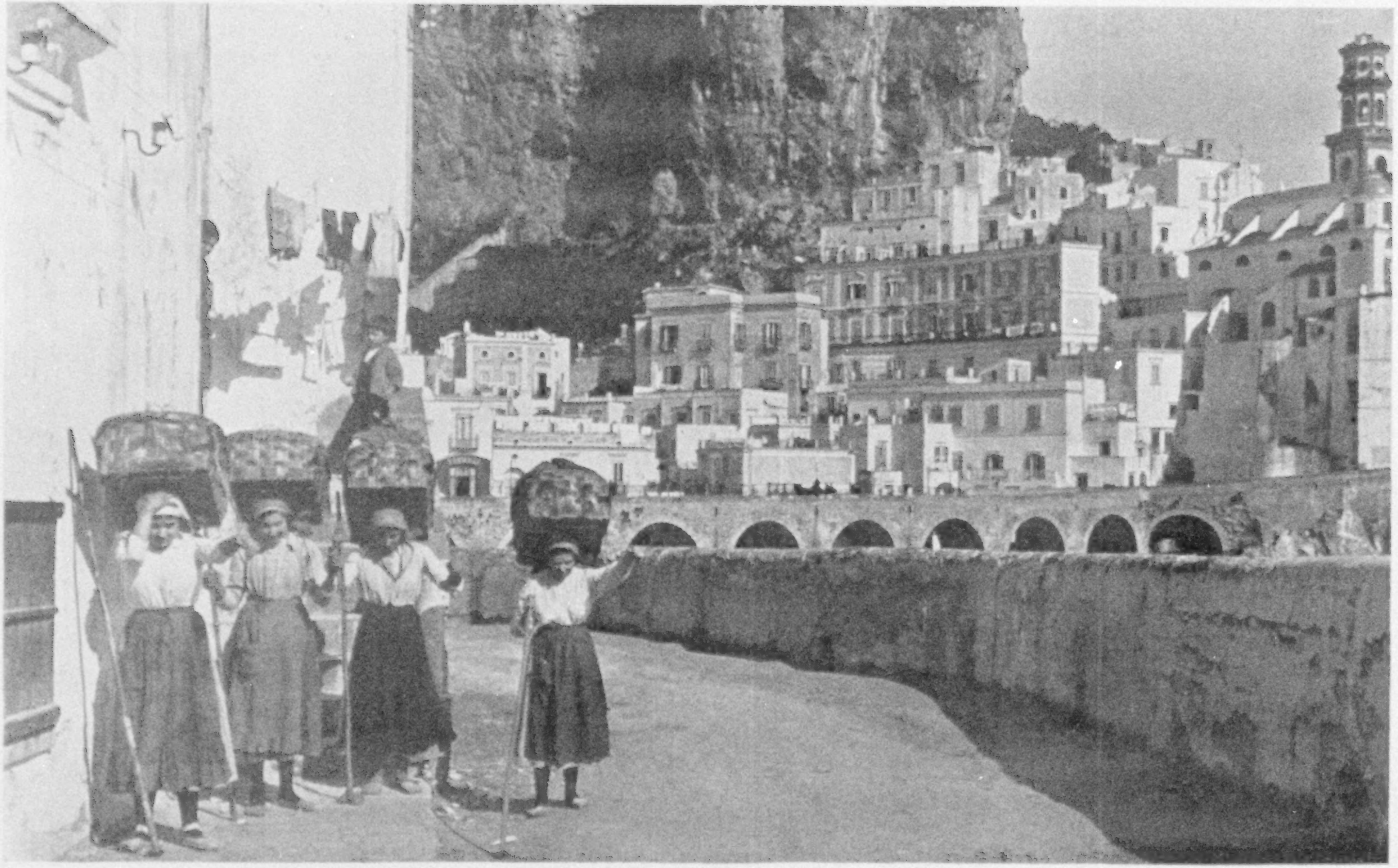


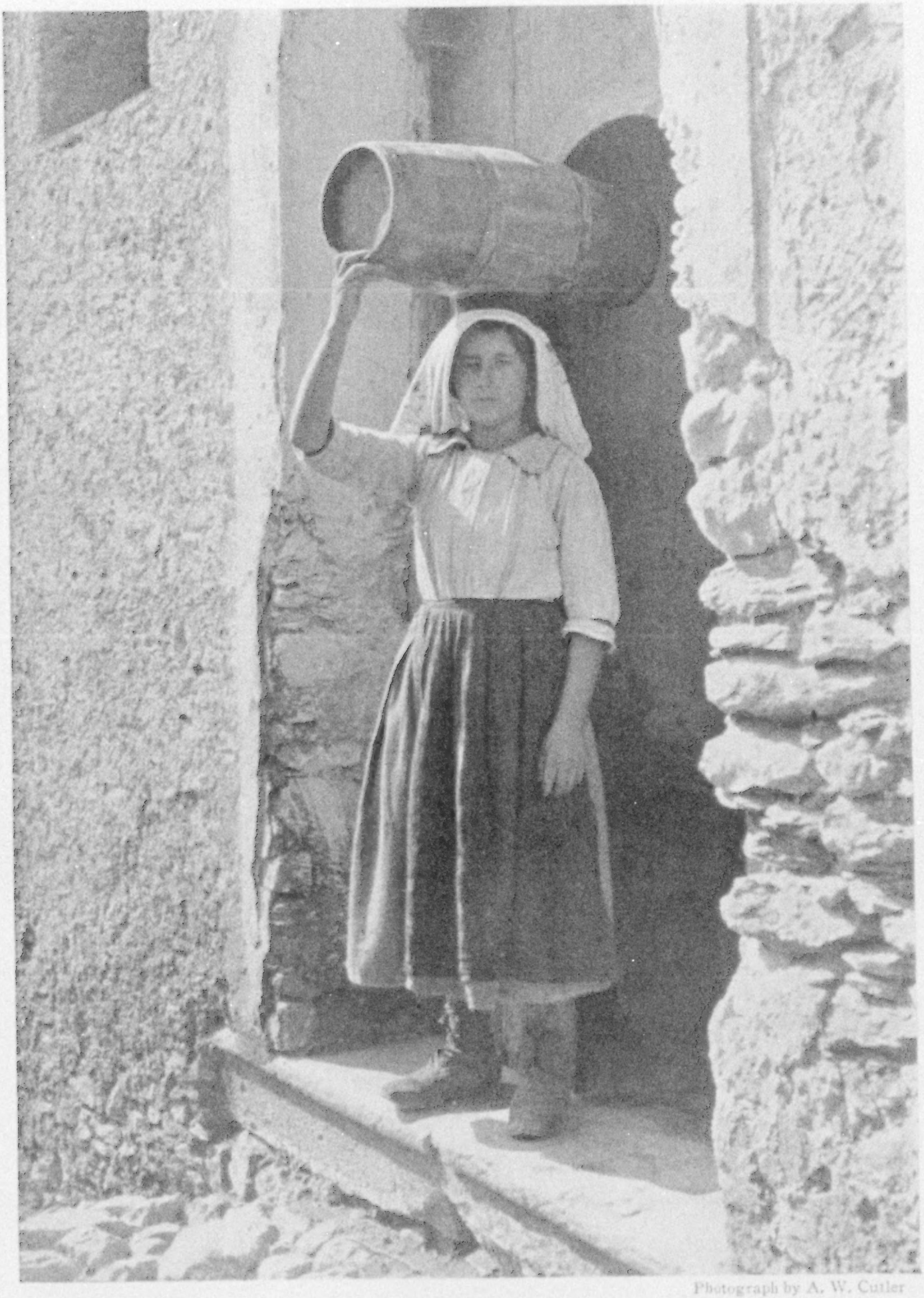
Photograph by A. W. Cutler

STALWART MAIDS OF ATRANI

Atrani, one of the most picturesque towns of southern Italy, clings to a steep hillside. Within its little church of San Salvatore di Biretto the doges of Amalfi's days of power were elected and buried.

Photograph by A. W. Cutler

CHATTING BENEATH A WAYSIDE SHRINE AT DRAGONEA



Photograph by A. W. Cutler

HER CASK IS FILLED WITH CALABRIAN WINE

Photograph by A. W. Cutler

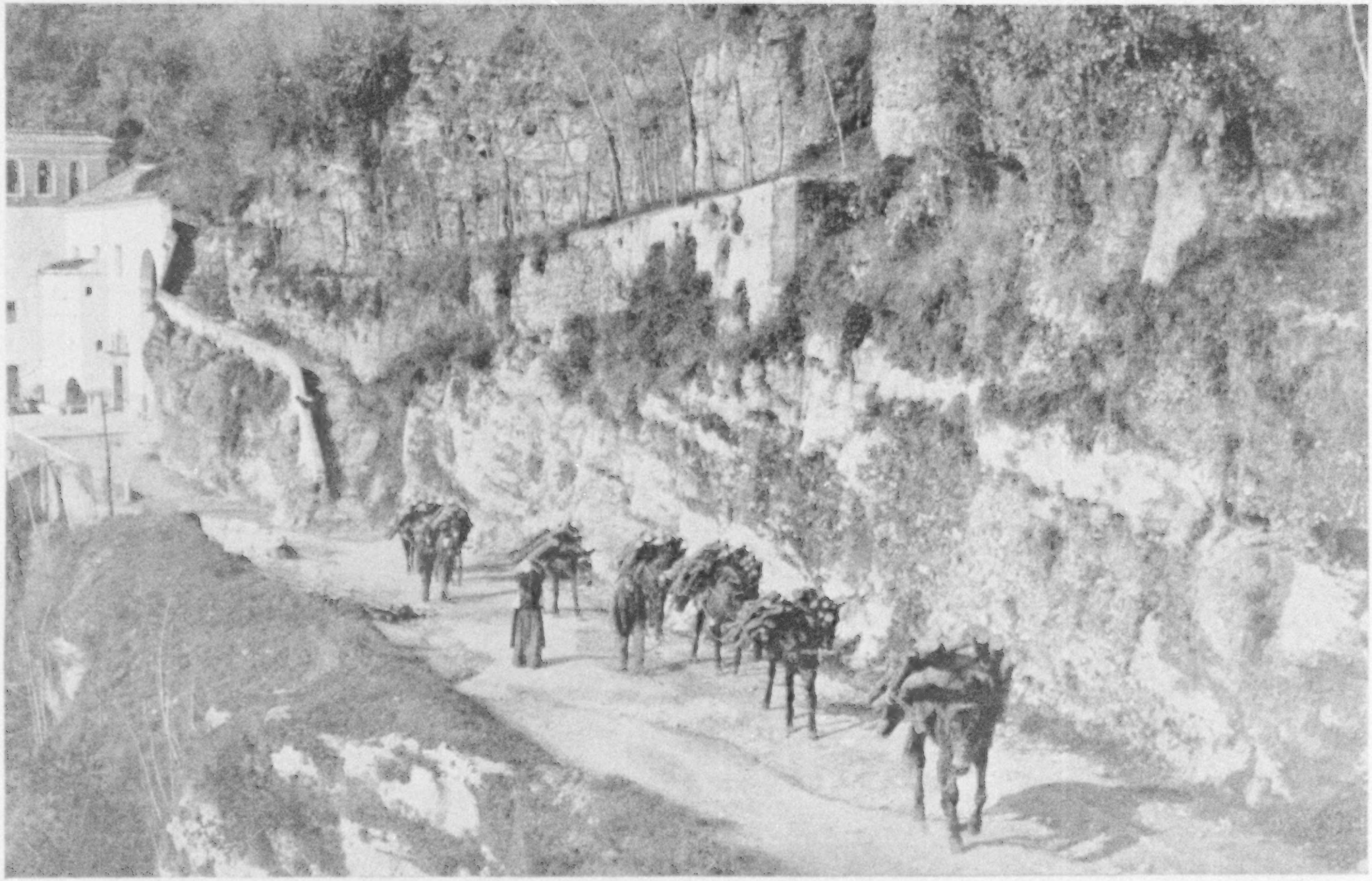
SAN FRANCISCO DI PAOLA STANDS GUARD OVER HIS HOME CITY

Just outside the city of Paola, the birthplace of this saint who founded the order of Mendicant Friars, there is an old monastery built in his honor around a fountain which he is said to have made gush out of the earth. To its waters are attributed many healing powers.

Photograph by A. W. Cutler

AN ITINERANT HARDWARE STORE IN NAPLES

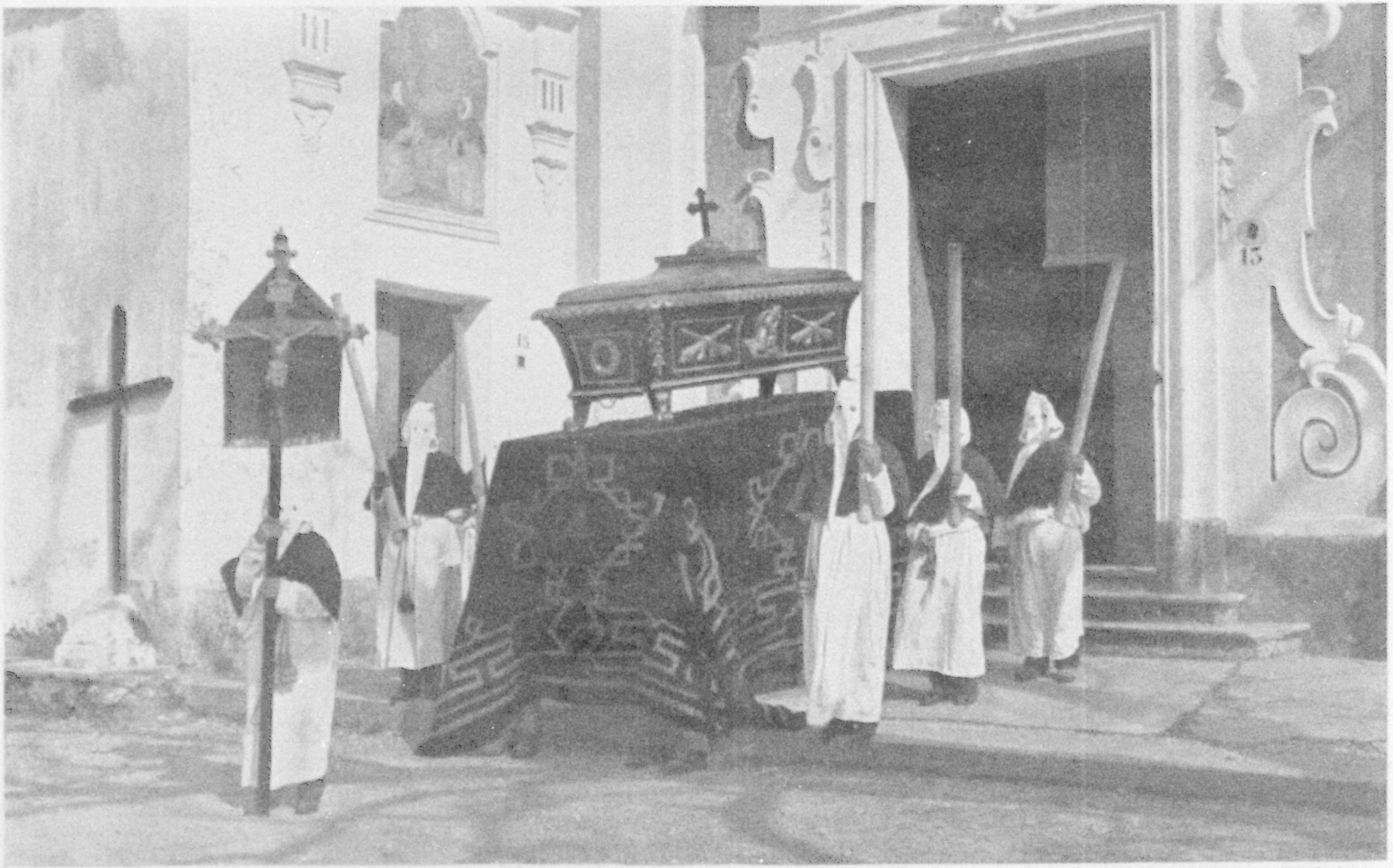
In southern climes, where the heat of midday is oppressive, the customer finds it a much simpler expedient to have his shop come to him than to seek his own necessaries in a crowded market-place.



Photograph by A. W. Cutler

A FIREWOOD DONKEY TRAIN FROM THE FOREST NEAR LA CAVA DEI TIRRENI

La Cava boasts of a library rich in parchments and diplomas; a near-by Benedictine convent, one of the most famous in southern Italy, and the Church of Pietra Santa, built with the rock on which the First Crusade was preached projecting through the floor near the altar.



Photograph by A. W. Cutler

FUNERAL PROCESSION LEAVING A CHURCH AT DRAGONEA

The lonely majesty of the ruins in Calabria, the withering malarial breath of its plains, and the constantly recurring earthquakes are factors which have instilled a simple piety in its people.

Photograph by A. W. Cutler

ADVERTISING HER WARES AT LA CAVA DEI TIRRENI

In lieu of a display window to call the attention of passers-by to her alluring fruits and vegetables, she resorts to a Simple Simon assistant. The country around La Cava, which is a popular summer resort, is rich and fruitful, its figs being especially celebrated.

Photograph by A. W. Cutler

A POINT OF VANTAGE

These children and their pig live in Policastro, now a town of barely 500 inhabitants, but a city of power and affluence in the days of ancient Rome. It fell before the Saracens in 915 and was destroyed 140 years later by the Normans under their heroic leader, Robert Guiscard.

Photograph by A. W. Cutler

AMALFI'S WATERFRONT IS ONE OF THE LOVELIEST IN ALL ITALY

XUM

Photograph by A. W. Cutler

A NEAPOLITAN CHAIR AND BASKET VENDER WHO MAKES PERSONAL DELIVERIES

Photograph by A. W. Cutler

CALABRIAN WATER-CARRIERS FROM PAOLA

Paola is one of the most important towns on the neglected southwest coast of Italy. In the hills back of the city lived Re di Sila, or the King of the Mountains, who during the 16th century was the terror of the Spanish viceroys and barons.

ENCIRCLING NAVAJO MOUNTAIN WITH A PACK-TRAIN

An Expedition to a Hitherto Untraversed Region of Our Southwest Discovers a New Route to Rainbow Natural Bridge

By Charles L. Bernheimer

With Illustrations from Photographs by the Author

A PARADISE for the faultfinder, for here he would have plenty to find fault with; "The land that God forgot," in the language of my guides who have an eye to happy grazing and hunting grounds; a veritable storehouse of delights for the sympathetic explorer—such is the broad desert country east of the Colorado River, south of the San Juan River, west of Navajo Mountain, and north of the Little Colorado River, stretching along the Arizona-Utah border (see map, page 198).

It is a desert of unique character—it is neither flat nor sterile. The voyager's eye is constantly confronted with startling vistas. A disorderly, unsymmetrical rock jumble, rugged beyond description, suddenly dissolves into a well-ordered canyon inclosed by cliffs, a thousand or more feet high, perpendicular and as straight as if carved with a knife.

Caves, often chains of caves, hundreds of feet deep and wide, the shape of an egg-shell and equally as smooth as its inner surface, stir the imagination, for many of those having a southerly exposure were the dwelling-places of prehistoric races of men.

With a suddenness inconceivable to the uninitiated, yet so familiar in these reaches of surprise, the barren, waterless, and soilless rock masses disappear and one is confronted with an oasis.

A cleft in the rocks serves as the gateway to a veritable Garden of Eden where all looks green, well watered, flourishing, and contented.

The sand blasts of ages have overlooked the canyon spring which faithfully continues to serve. The toiling travelers, man and beast, are joyfully revived.

Then there are the desert flats, sage covered, pleasing, and interesting in their temporary monotony. Rare minerals abound for the geologist; unusual plants for the botanist; cliff ruins, pottery, basketry, and rock inscriptions for the anthropologist; color and form effects for the artist; and an educational opportunity of superlative worth for the student on his vacation under the chaperonage of a tutor.

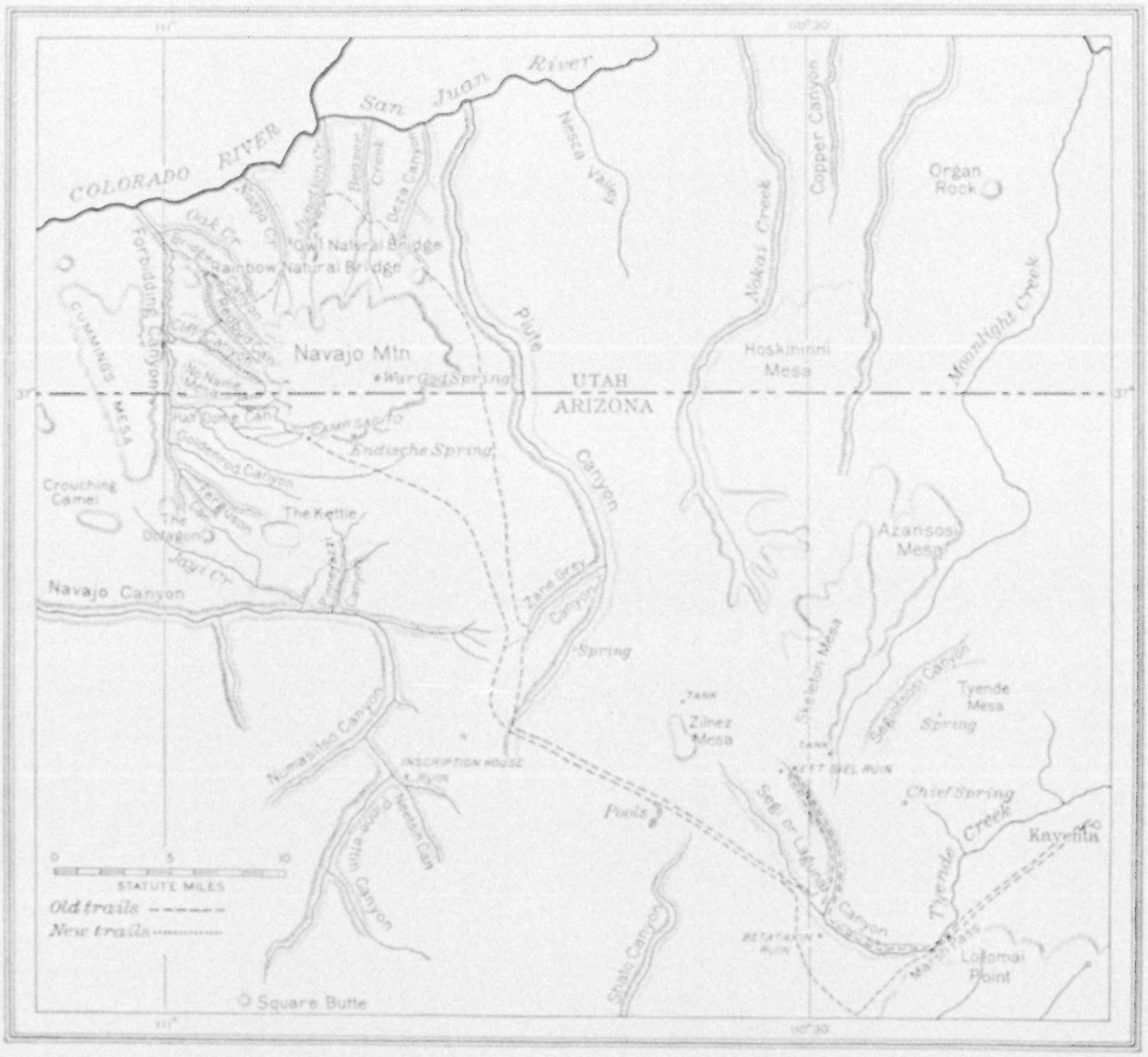
But, permeating all, there is a sense of physical lonesomeness, mingled with an almost constant feeling of the presence of the Creator.

Animal life is scant; but this has its advantages, for who would not do without game, which we at least did not come to kill, if compensated by a comparative paucity of rattlesnakes, gila monsters, scorpions, centipedes, ants, and mosquitoes? All of these are there, but not in annoying numbers.

The Surroundings of Rainbow Natural Bridge

In the very heart of this expanse towers the oft-described Rainbow Natural Bridge.* Were it located elsewhere than in this cross-bedded sandstone country, it would be a freak, but in its own setting it is a natural and logical phenomenon. On the northwest slope of Navajo Mountain it partially spans one of the canyons which lies deep in the eroded flanks of the monstrous radiating buttresses that descend from the sides of this 10,000-foot mountain.

*See also, in the National Geographic Magazine, "Colossal Natural Bridges of Utah," September, 1904; "The Great Natural Bridges of Utah," March, 1907, and February, 1910, and "The Great Rainbow Natural Bridge of Southern Utah," November, 1911.



Drawn by A. H. Bumstead

SKETCH MAP SHOWING THE NEWLY DISCOVERED ROUTE TO RAINBOW NATURAL BRIDGE

The Bernheimer Expedition outfitted at Kayenta, Arizona, proceeded northwest and, after failing in 1920 and 1921, succeeded in circling Navajo Mountain by continuing west, during the summer of 1922.

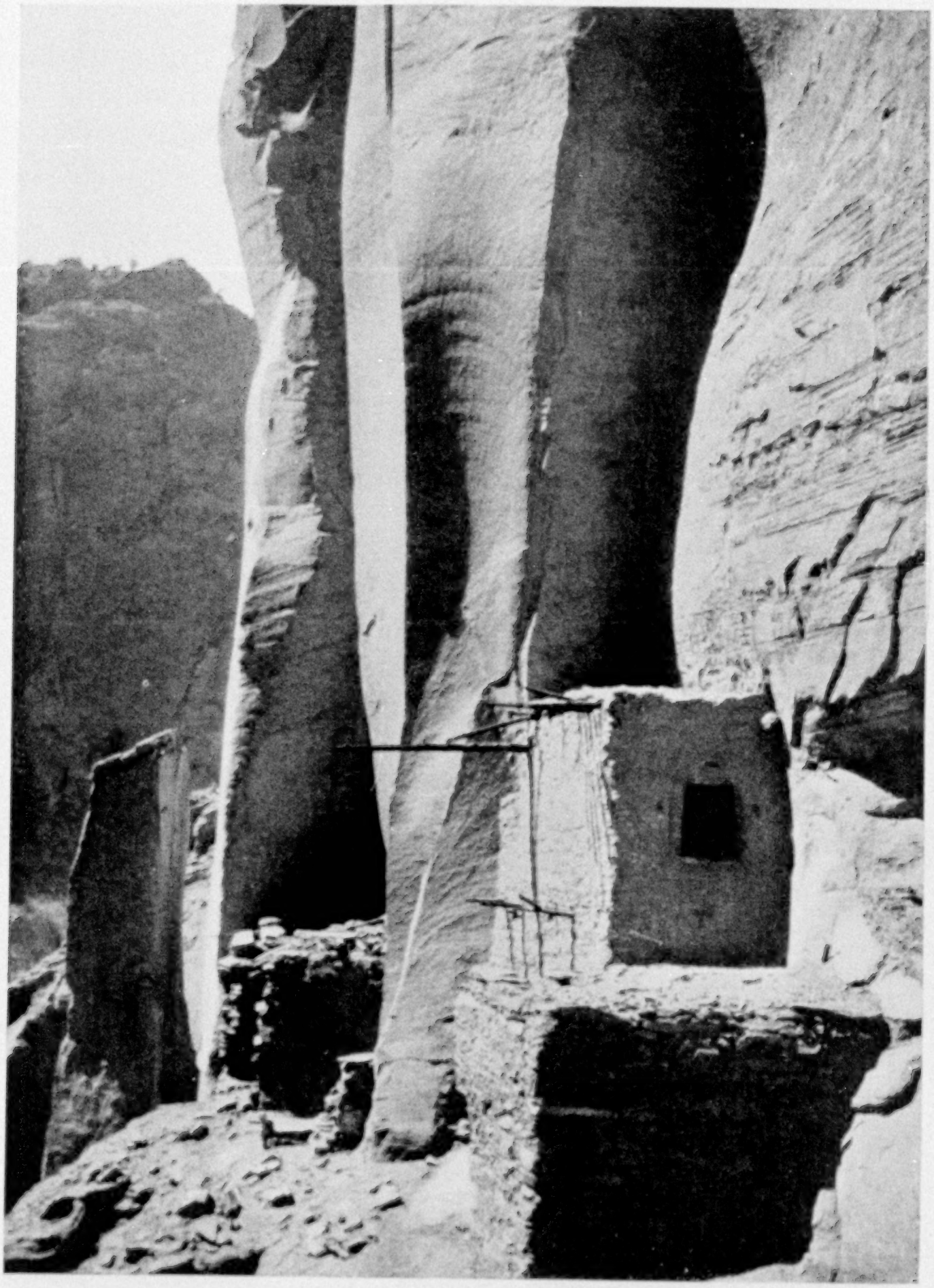
Four miles farther down, the streamlet which contributed to the bridge's formation joins a similar watercourse emanating from Forbidding Canyon, and three miles farther on the two, united, empty into the Big Colorado River.

THE 1921 EXPEDITION FAILS

In order to reach the Rainbow Natural Bridge in 1920, we climbed Navajo Mountain, but finally had to skirt it by a circuitous trail to the east.

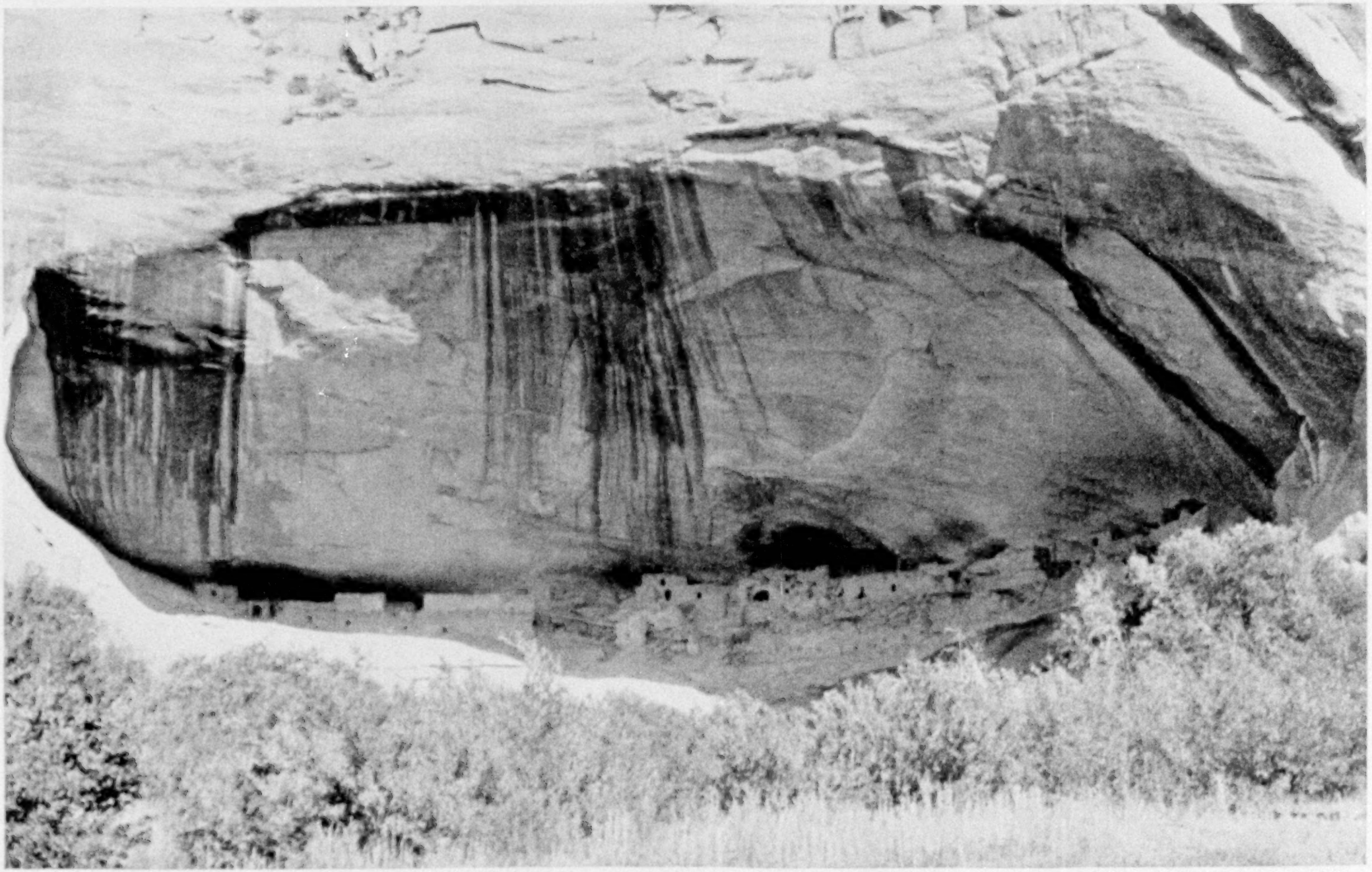
In 1921 we organized our expedition to reach the Rainbow Natural Bridge by a route to the west of Navajo Mountain, utilizing Forbidding Canyon. We failed by what we then estimated as about seven or eight miles. Forbidding Canyon proved impassable for a pack-train. Lack of food and feed, horseshoes, tools, and explosives compelled us to leave the accomplishment of our expedition's object for another year, when we would have an equipment calculated to improve our chances for success.

However, it was clear to us that Forbidding Canyon was not to be our avenue of approach; it was too rugged and snarly; it was blocked by steep shelves that could not be descended, necessitating detours on trailless mountain sides, often dangerous to man and beast.



WESTERLY EDGE OF THE BETATAKIN CLIFF RUINS: ARIZONA

Note the massive, sharply defined rock pillars. These ruins are located in a side canyon of Segi or Laguna Canyon, a day's journey from Kayenta.



A GENERAL VIEW OF THE CLIFF RUINS AT KEET SIEL, IN A BRANCH OF SEGI CANYON

In this canyon many prehistoric sites are located in extraordinarily picturesque surroundings. Between the wild gooseberry bushes, aspen, and oak in the foreground and the wall on which nestle the ruins is a 60-foot-deep ditch filled with broken pottery.

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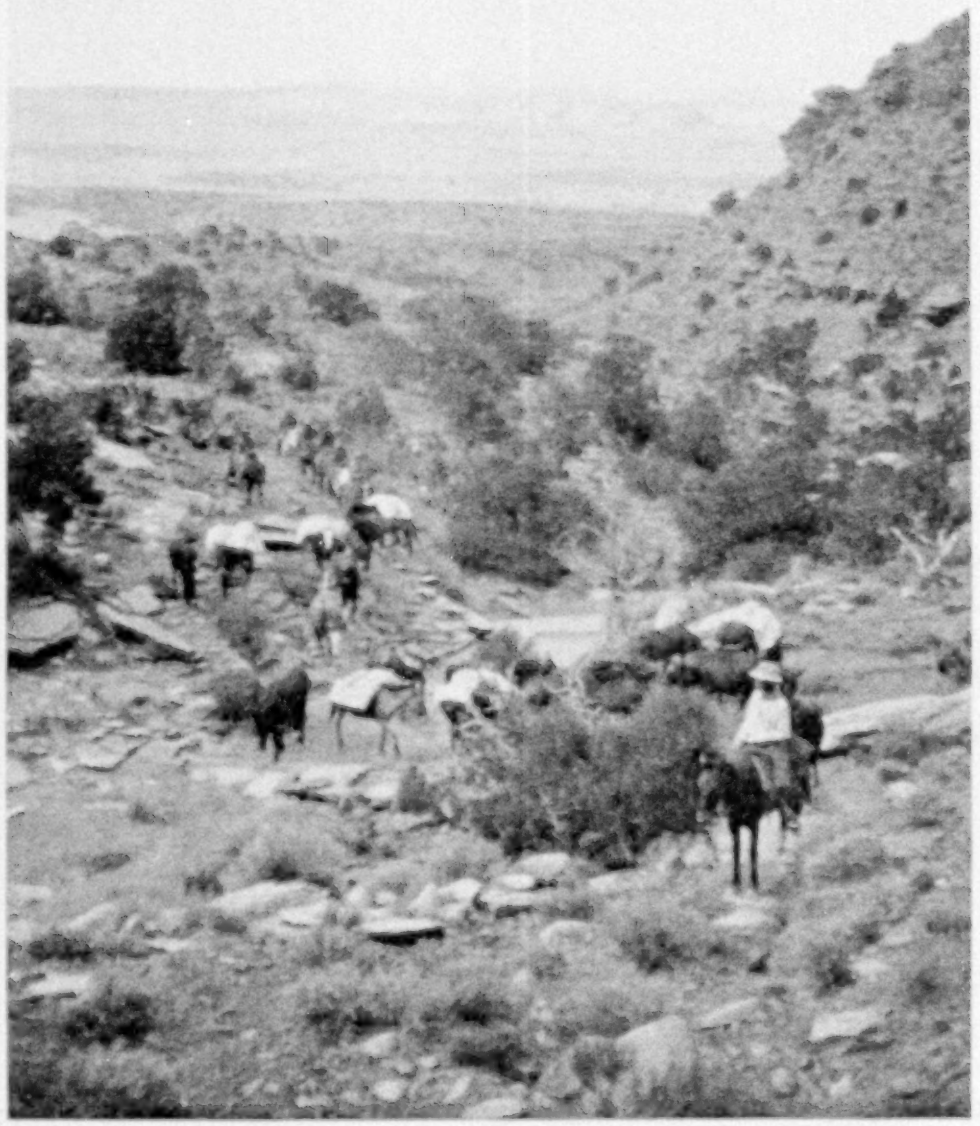
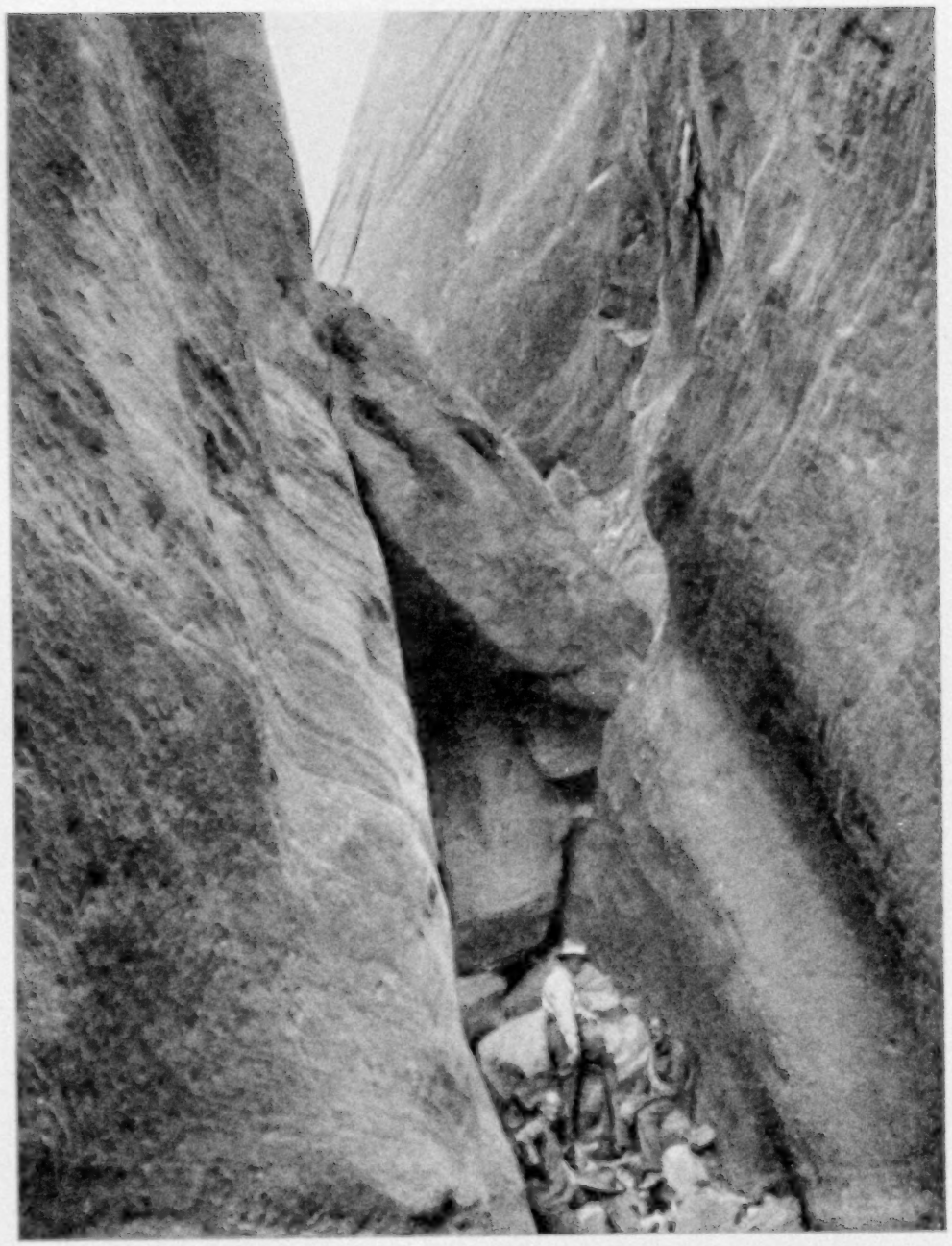
ANOTHER VIEW OF THE KEET SIEL RUINS

Inscription House, Betatakin, and Keet Siel cliff-dwelling ruins lie to the west of Kayenta, along the trail to Navajo Mountain.

ON THE MESA TO THE WEST OF SEGI CANYON

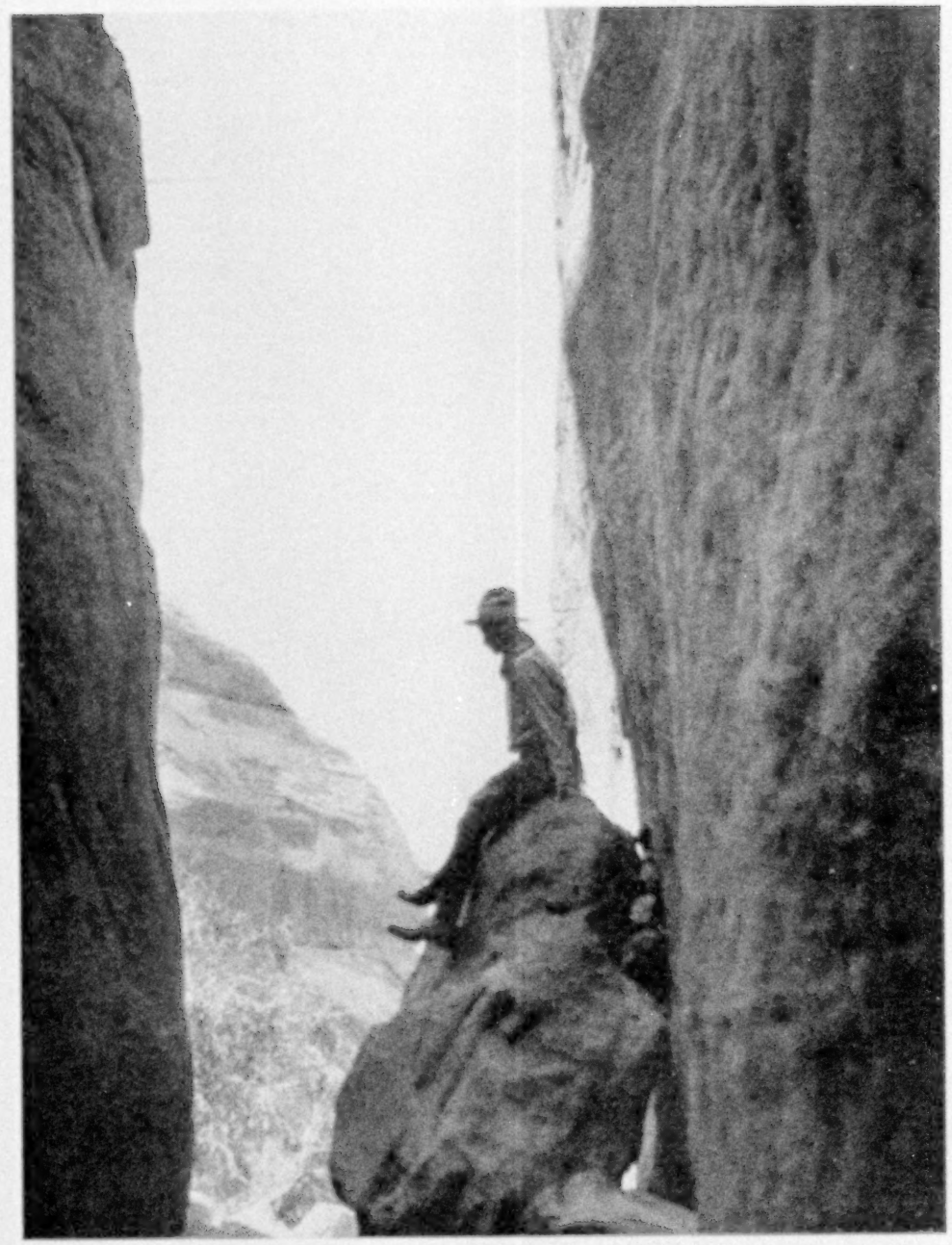


THROUGH CEDAR AND PIÑON PINE, NASJA CREEK



ATTEMPTING TO REACH THE TOP OF NO NAME MESA

Smaller rocks between the larger ones had to be dislodged to create a hole big enough for man to crawl or hoist himself through.



GATEWAY TO THE TOP OF NO NAME MESA

It is called Johnson's Hole, after the guide of the Bernheimer Expedition, to whom its discovery was due.

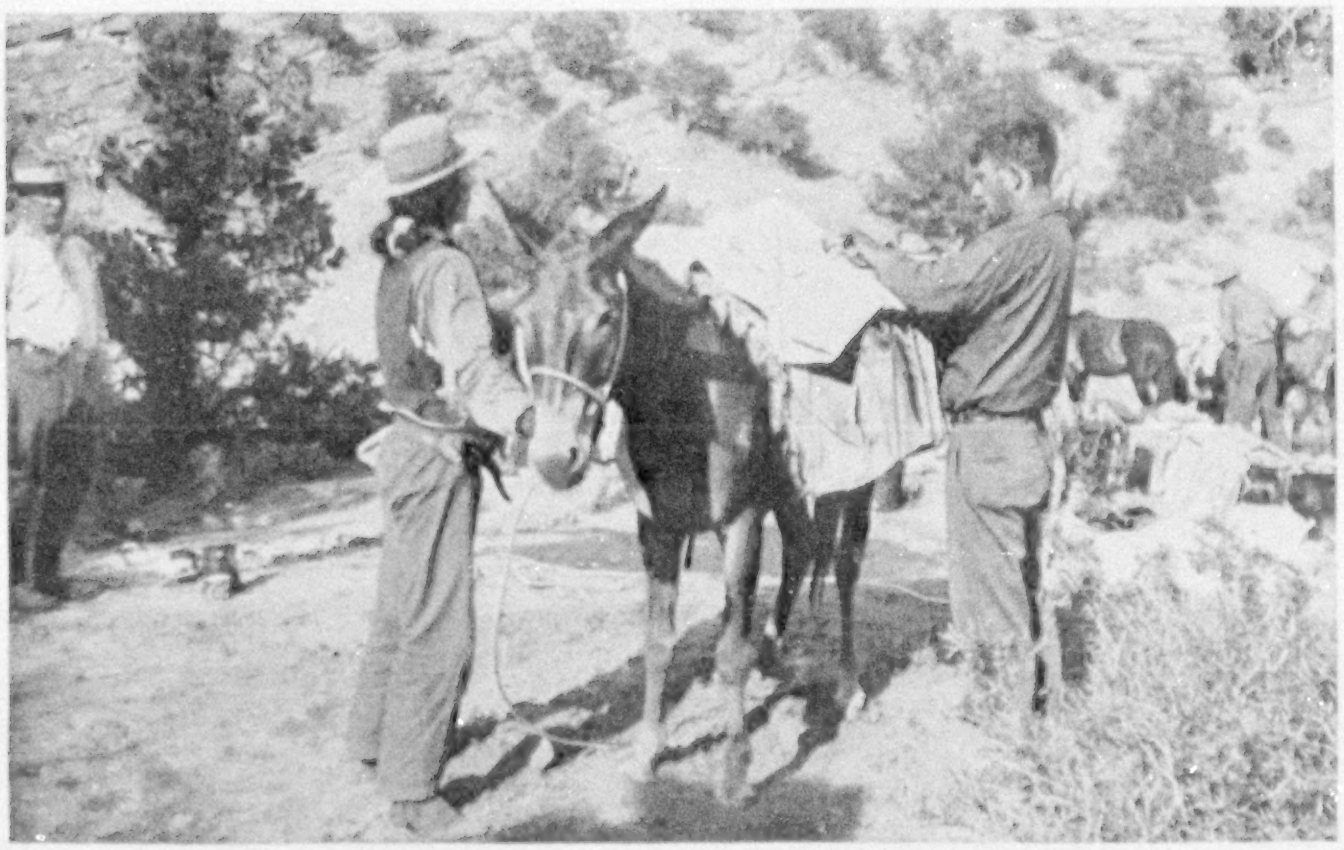
A CARAVAN OF 28 ANIMALS ON THE EDGE OF SEGI CANYON

Note the crowding of the animals, a perilous habit when permitted near the brink of a canyon.

XUM

TRAVELING OVER THE "BALDHEADS" ON THE EASTERLY ROUTE TO RAINBOW NATURAL BRIDGE

This sort of travel is not relished by either man or beast. The rocks in places are hard and slippery and there is nothing to stop a fall in case of a misstep. The purple sage, a rare and beautiful flowering plant, found in the crevices of these "baldheads," blooms in May and June.



BREAKING CAMP AT SAGITO, ON THE SOUTHWEST EDGE OF NAVAJO MOUNTAIN

"We knew not where we would arrive, for the journey before us was through lands never before penetrated by white man."

Besides, Forbidding Canyon had a way of abruptly closing up, its streamlet in the meantime forming an underground passage with sudden ghastly pothole vents or crowded polished throats to one side of a high steep shelf which blocked all travel except for man on all fours and with the aid of a rope.

SUCCESS ACHIEVED IN 1922

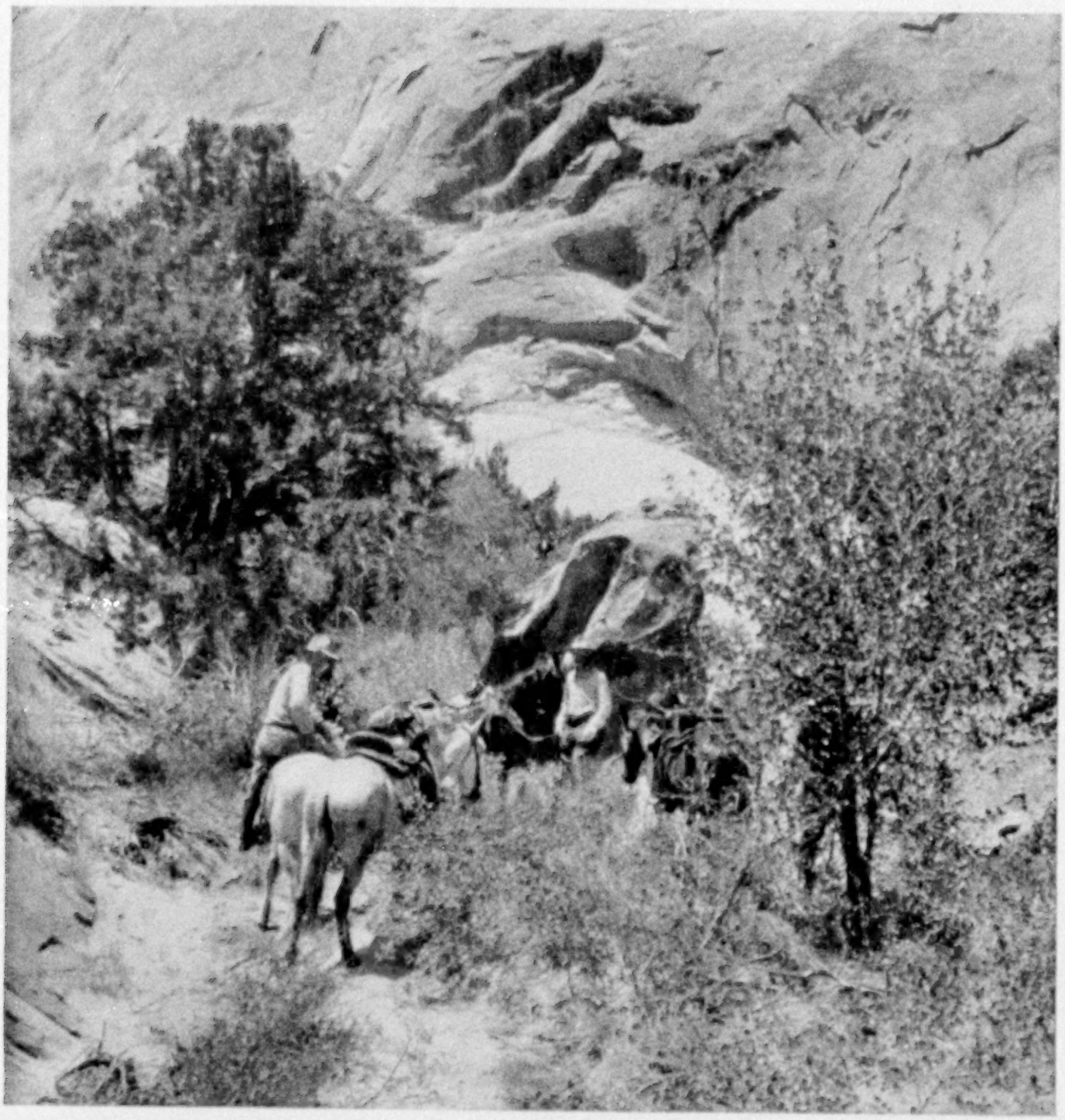
For many years it had been my ambition to find a passage west of Navajo Mountain to the Rainbow Natural Bridge, thus penetrating one of the most appalling rock jumbles on this continent. This feat was consummated by our expedition of 1922.

To John Wetherill, of Kayenta, Arizona, who discovered the Rainbow Natural Bridge in 1909, and who has been my guide for three successive years, is also due the discovery of a feasible route to the Rainbow Natural Bridge, the object of our expedition of 1922, namely, the "circumnavigation" of Navajo Mountain and the location *en route* of cliff ruins and prehistoric home sites, the ancient habitations of basket-makers as well as pottery-makers on this continent. Of these latter we found a great number, many of which at some future time might well become the objects of careful excavation and examination.

Our outfit consisted of seven men and 28 horses and mules. John Wetherill, of Kayenta, Arizona, and Ezekiel Johnson, of Blanding, Utah, acted as guides for Earl H. Morris and the writer; Al and Jess Smith attended to the animals. At one time we had two Indians with us, but we sent one home shortly after we started out, as he proved of no value. We kept the other, even less useful, as he had been injured and we felt it our duty either to get him home to his own people or within reach of proper medical care.

Two days devoted to scouting from our camp, which we named "Sagito," meaning water in the rocks, near the southwestern point of Navajo Mountain, resulted in our finding a route that skirted its western flank.

Two of the mountain's buttresses, steep and trailless, were to be crossed as well as three canyons lying in their depths. These feats accomplished, we arrived at a deep cut, immediately south of No Name Mesa, which we named Half Dome Canyon.



WHERE HORSES AND MULES WERE KEPT WHILE THE ROCKS IN REDBUD PASS WERE BEING BLASTED

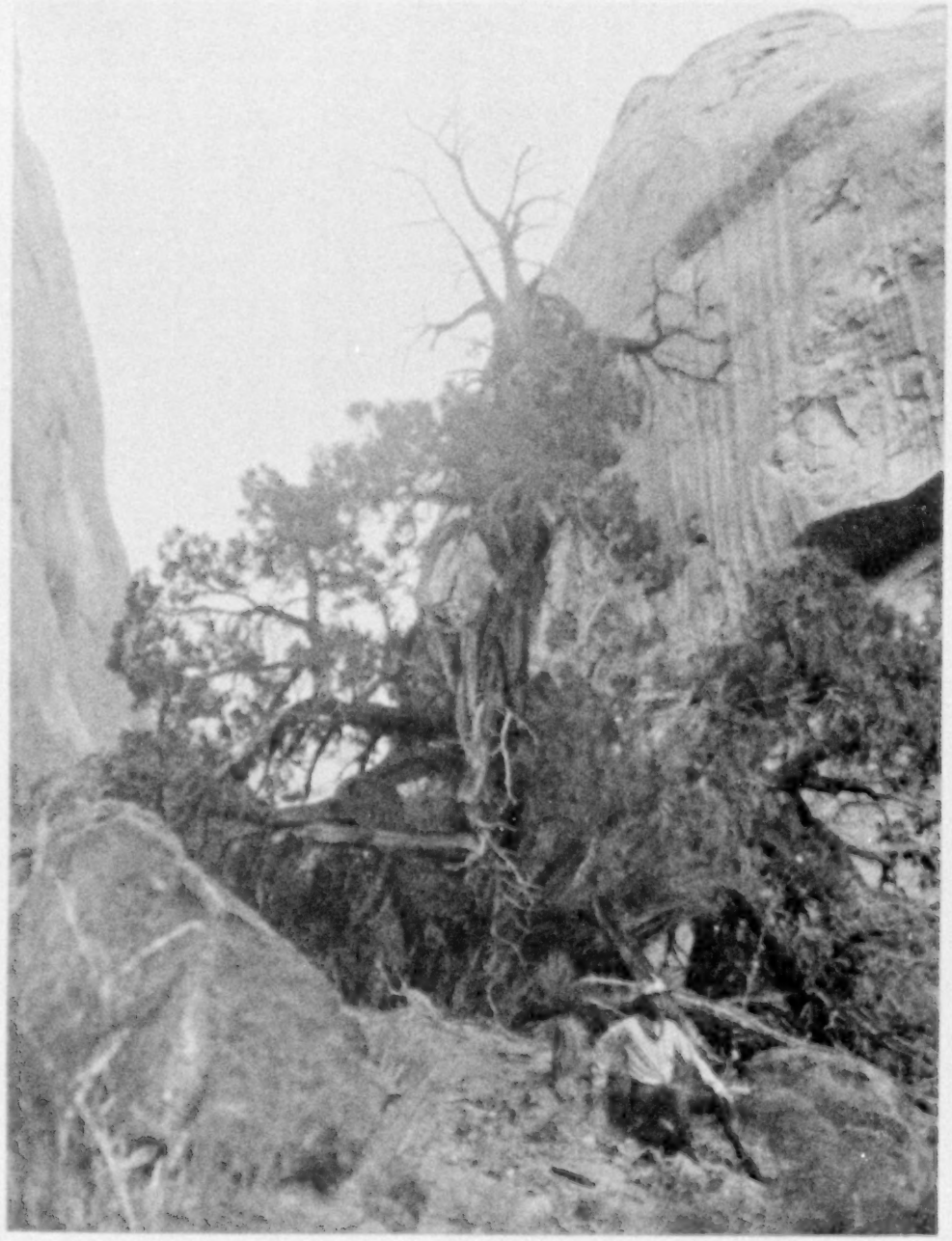
Note the redbud tree in the right center, after which the pass was named. From its very tough wood serviceable crowbars were made. The Indians used to fashion their bows from the wood of this tree.

This cut it was necessary for us to follow longitudinally. We struck a very old, disused Indian trail. I call it a trail because in a few places we found stones placed by human hands, at some time in the dim past, on top of rocks where Nature would not have placed them; otherwise there was no trace of path or trail.

We climbed out of Half Dome Canyon in a northeasterly direction to reach what we named The Saddle, a ridge of cream-colored limestone connecting Navajo Mountain with the terra-cotta colored No Name Mesa.

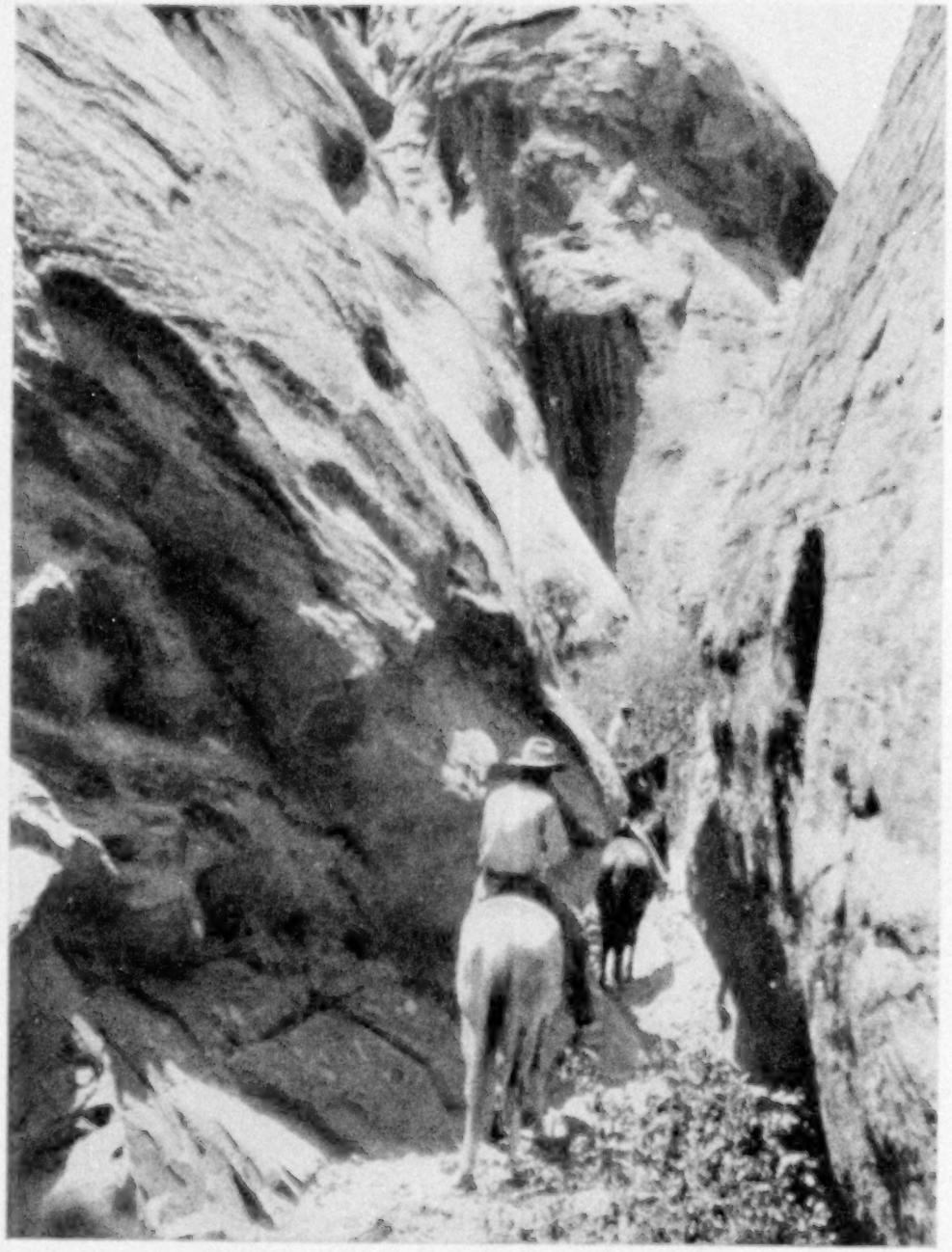
This was an endurance test of the most distressing sort for man and beast, to be followed by one equally as trying, with all hands afoot, in order to get down on the other side of The Saddle into what we named Cliff Canyon.

That descent, over rolling rocks and sliding sands, around boulders and roots,



THE WESTERLY ENTRANCE TO REDBUD PASS

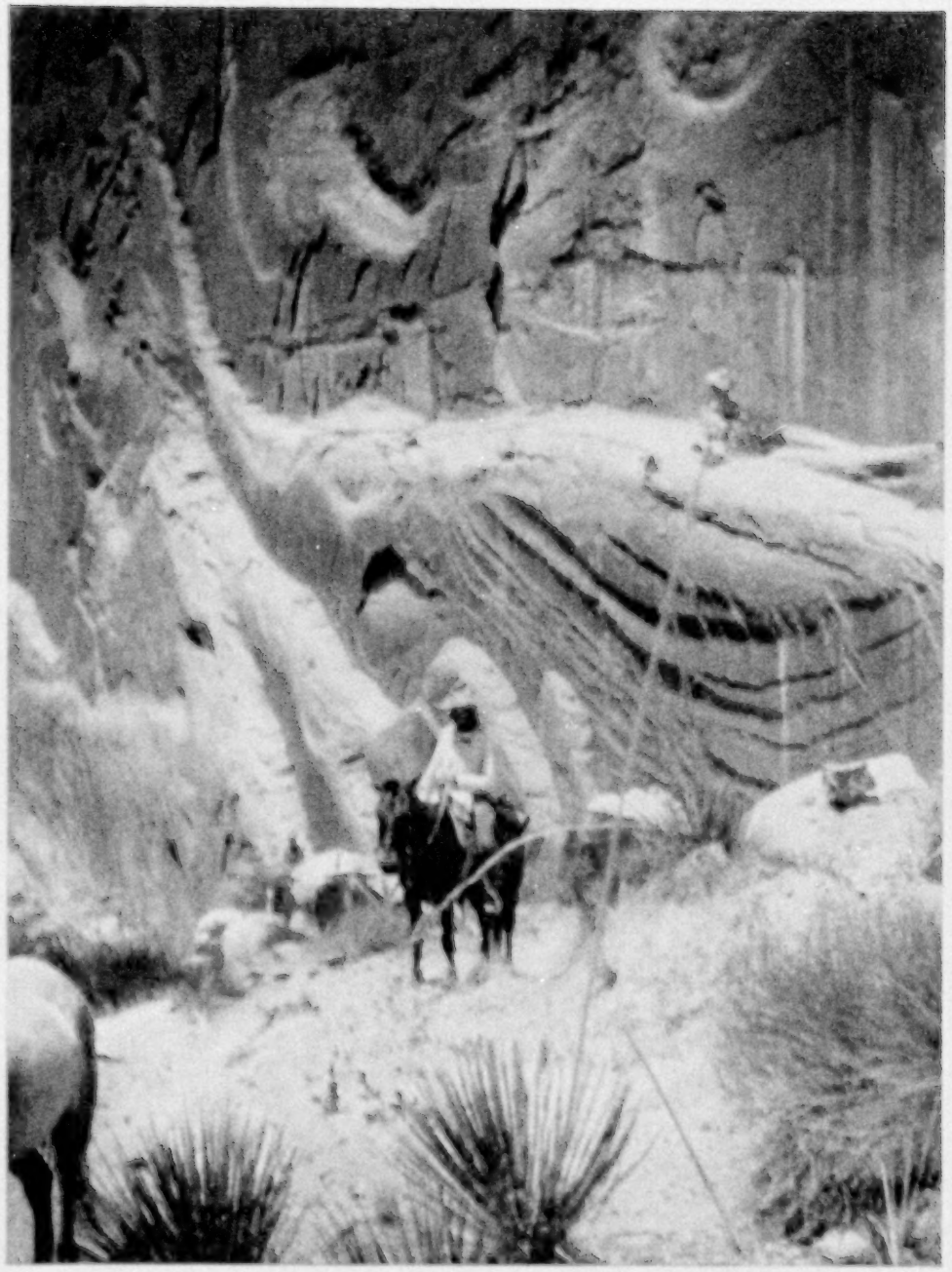
Note the weather-beaten, harassed, yet luxuriant, desert cedar.



REDBUD PASS, LOOKING EAST

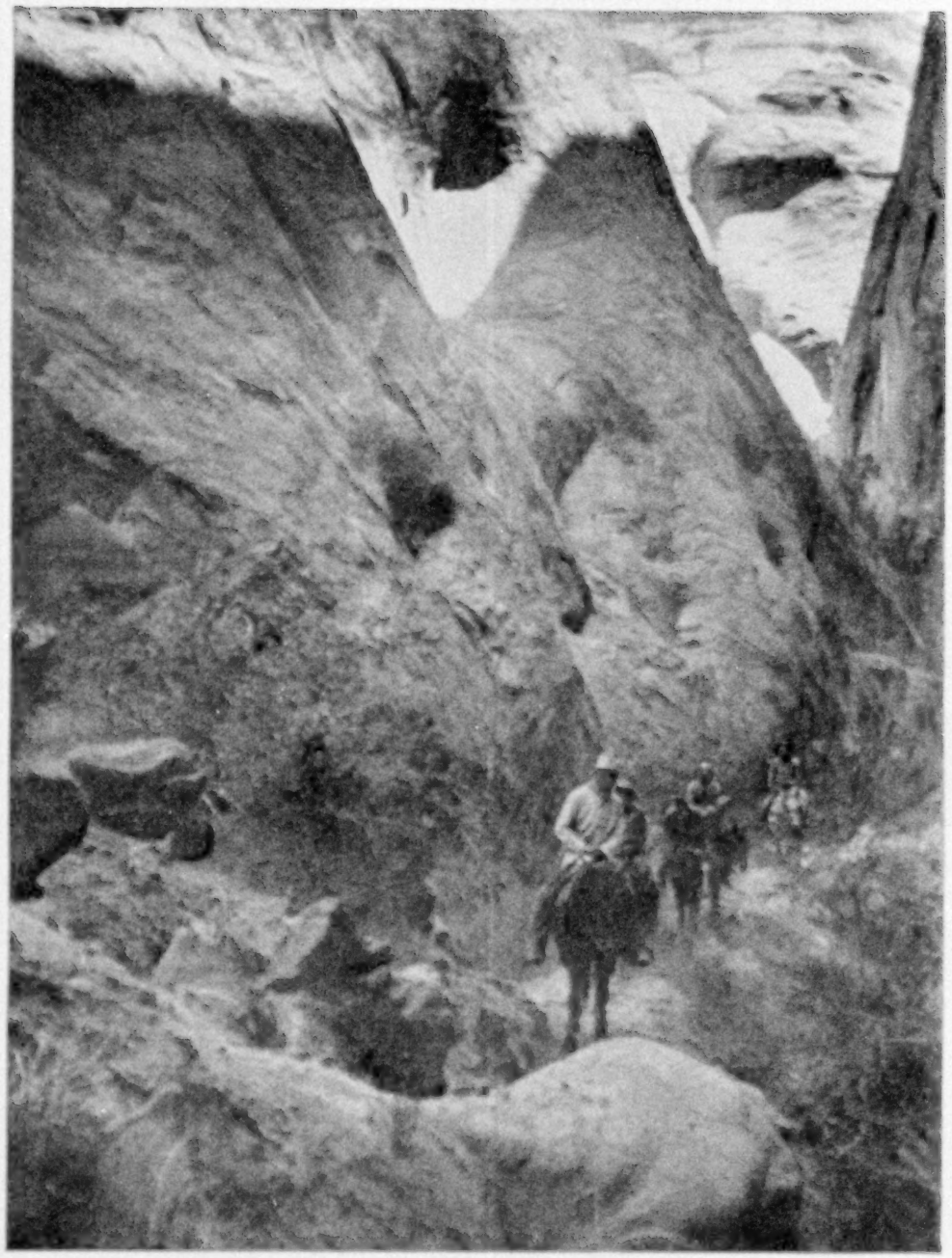
This defile had to be widened with pick and sledge for the pack animals.

XUM



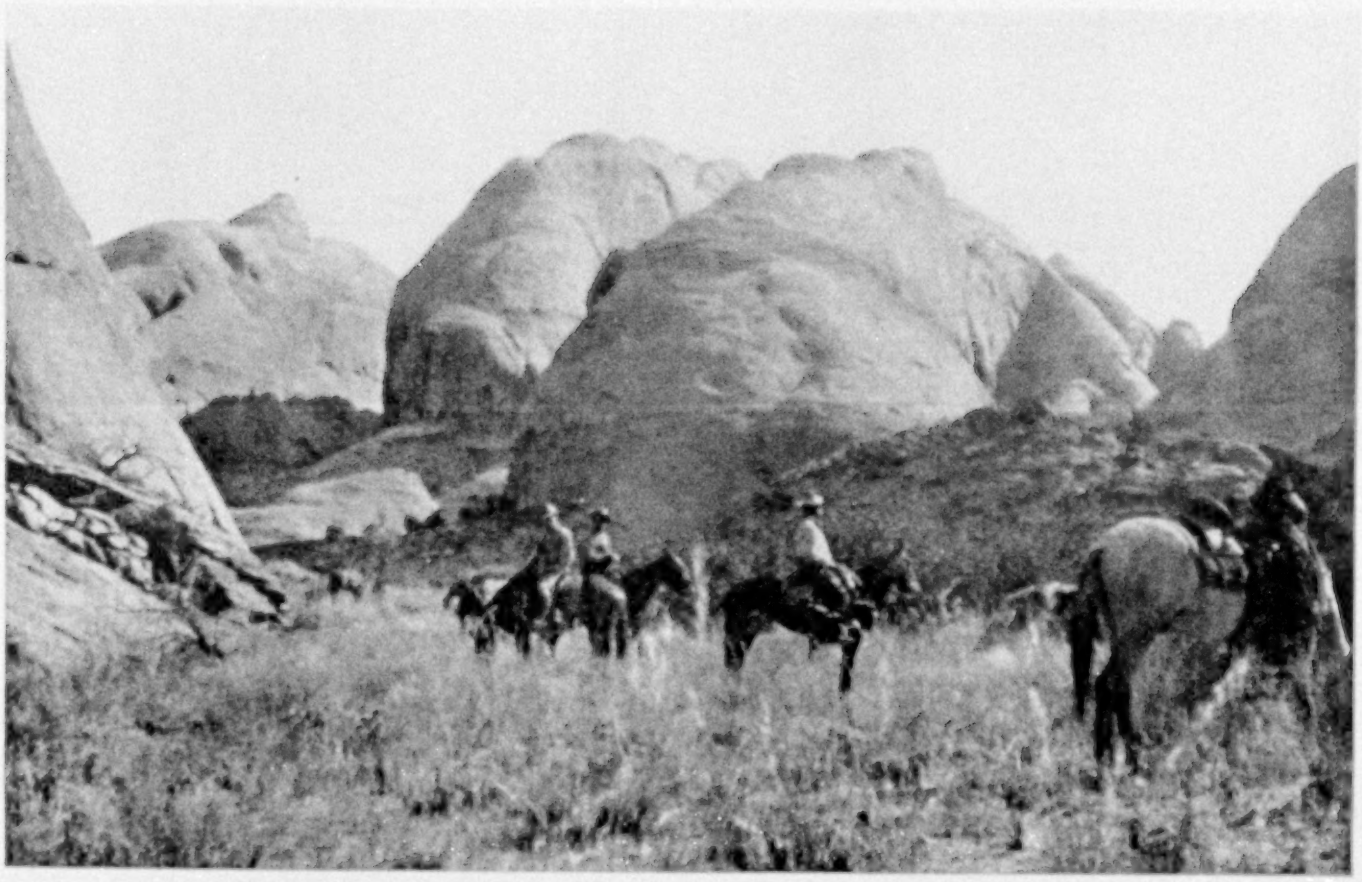
REDBUD PASS HAS ALL THE CHARACTERISTICS OF A FAIRY GARDEN

The trees are twisted, snarled, and split asunder. The bushes, especially the silver scale, are of a glittering whiteness. The century-old yucca plants, having 10-foot-high fruit stalks, added to the fantastic rock structure, give a supernatural aspect to this corner of the Bad Lands.



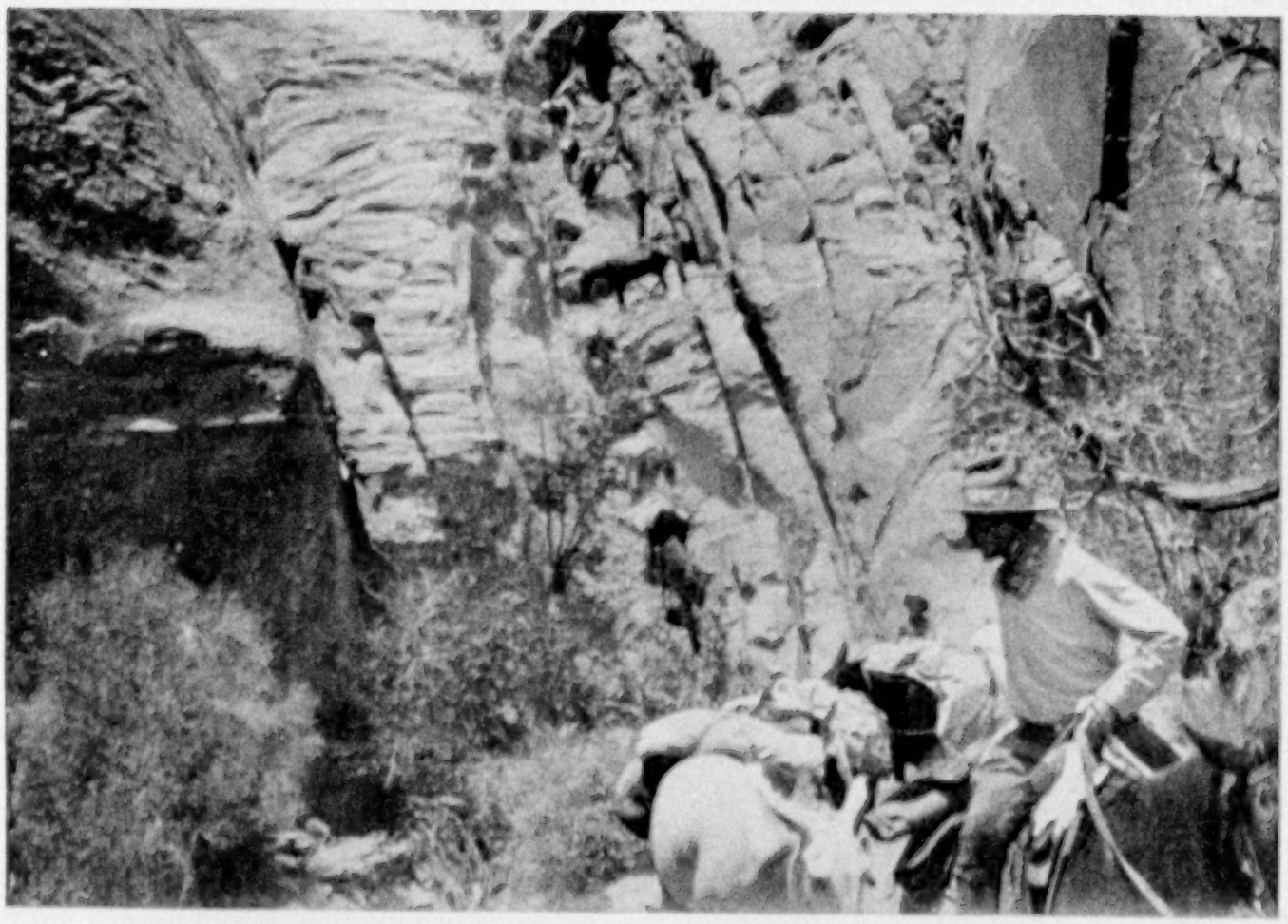
ASCENT OF REDBUD PASS FROM THE WEST

The dark purple shadows, so welcome in the July sun at noon, create sharp and weird contrasts against the salmon-pink sunlit places. After negotiating this pass the Rainbow Natural Bridge was reached without the necessity of dismounting.



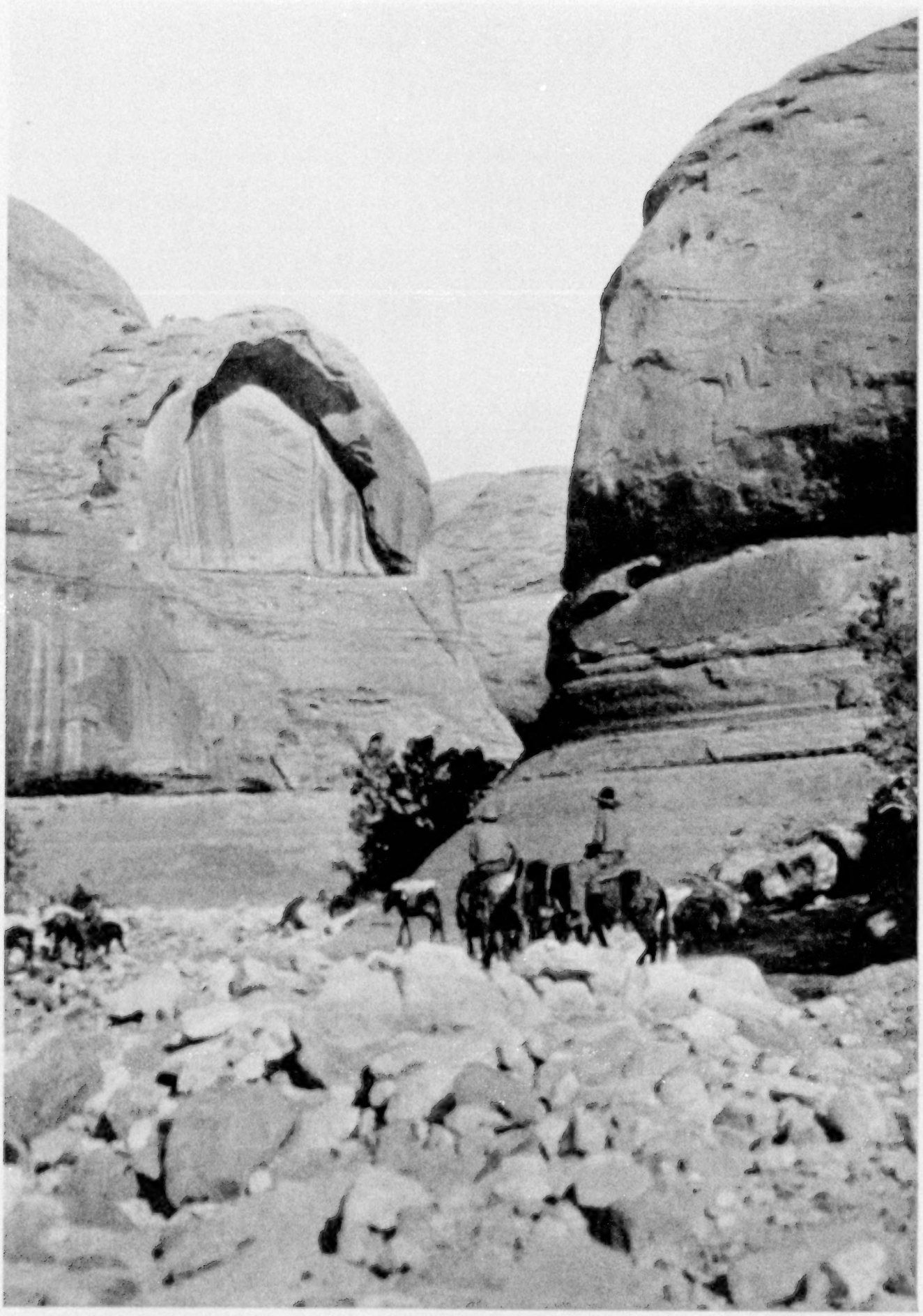
THE END OF REDBUD PASS NEAR ITS JUNCTION WITH BRIDGE CANYON

The rock forms, bald and soilless, are characteristic of this region.



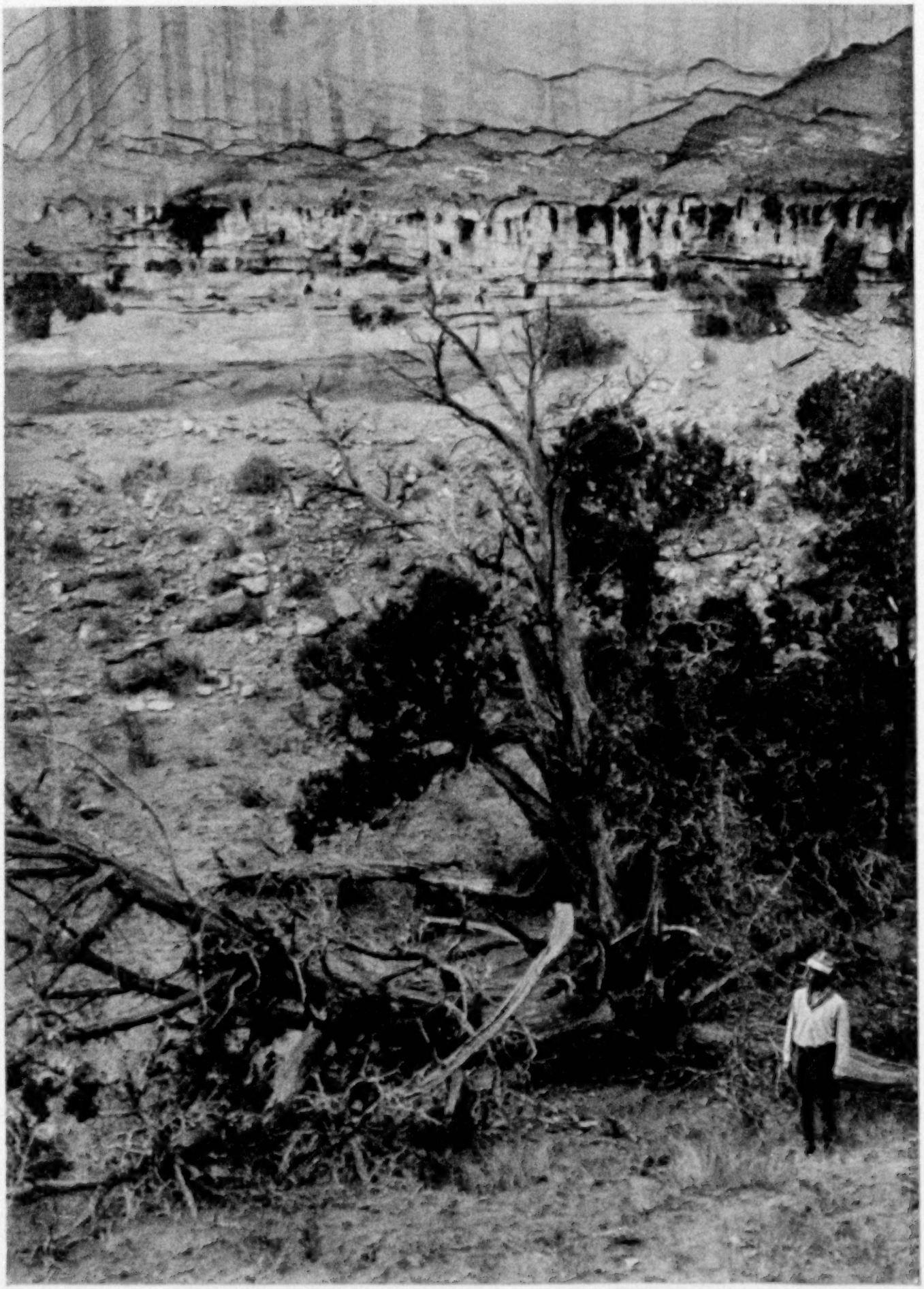
CLIMBING DOWN THE TRAIL IN REDBUD PASS

It took four days to blast a way with dynamite, black powder, and T. N. T. through one of the three vertical rock ledges, which had to be broken up, the crevasse filled and "leveled."



THE DIVIDE IN REDBUD PASS

To the left is the cleft through which a trail was blasted. Behind the bush in the right-hand center began a series of dried-out, sand-filled potholes. Fortunately, the ninth and lowest of them contained still water, which we could reach with rope and bucket. Without this water, trail-making might have been greatly delayed.



THOUGH ALMOST TORN INTO SHREDS, THIS DESERT CEDAR LIVES ON IN REDBUD PASS

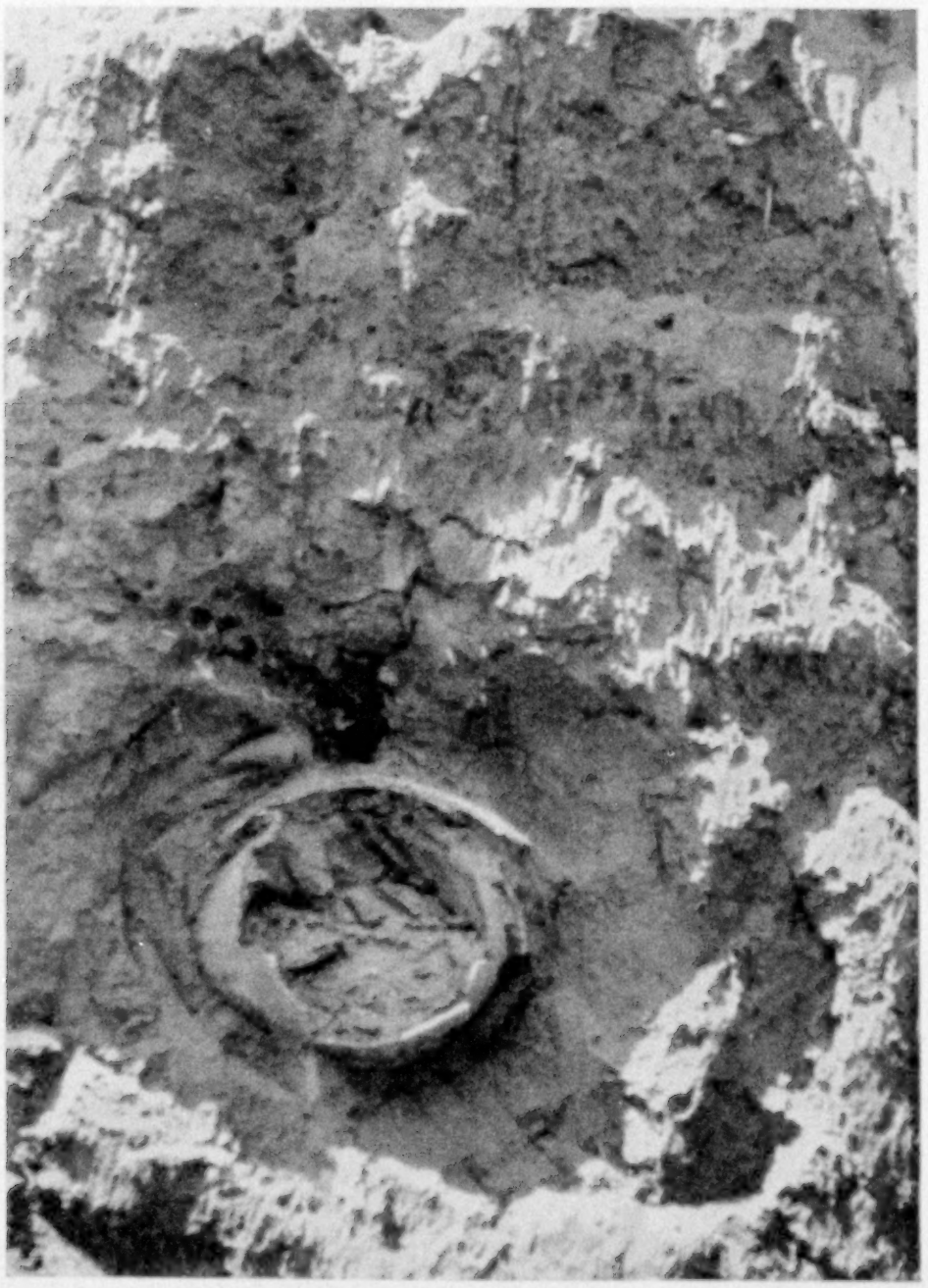
had its thrills, for a caravan of 28 animals must be kept moving at a fairly even and rapid tempo or chaos reigns.

Sliding loads, kicking, biting, and crowding animals, and dust-clouds completely obliterated all thoughts of weariness, dizziness, and danger. It required complete concentration to take us down some 2,500 feet, over a sheer and apparently impassable slope.

It was late in the afternoon when we reached the bottom of Cliff Canyon, so named by us because of the sheer cliffs which lined it.

The heat was "July-esque." The streamlet at its bottom was dry. Our animals had had no water since early in the morning and there was practically no grazing on the wayside.

My half-gallon canvas water-bag was less than half full; no one of us had ever been here before; we did not know when water would be reached. To turn back was impossible, confronting us was the unknown!



REMAINS OF AN ANCIENT POT IMBEDDED IN ADOBE IN BLACK-BOARD CLIFF RUINS BETWEEN NAVAJO MOUNTAIN AND GOLDENROD CANYON

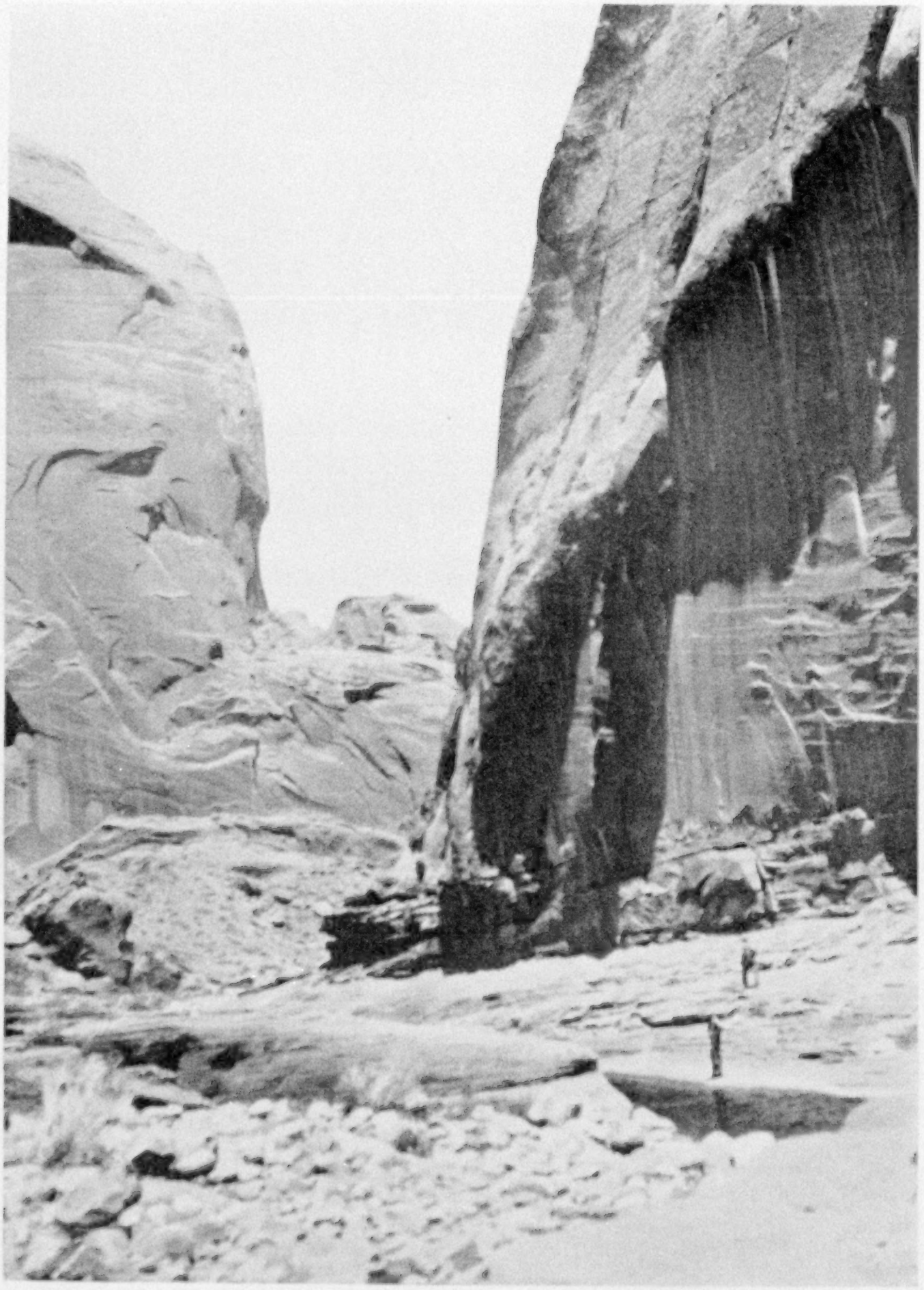
The canyon was parched and thirsty-looking. Even the cacti, those reservoirs of moisture, looked shriveled and shrunken. I had been pondering as to the best use for the little water left in my bag; my companions had none whatever. Would it be sufficient to moisten the noses and mouths of our animals next morning, so that they might be able to drag on, if need be, without load?

Such lugubrious reflections kept tormenting me for hours, when suddenly, at about sundown, a silvery shimmer, far ahead, a catching and reflecting of the departing sun-rays, heralded the presence of water. "To," which in Navajo means water, and "shineago," which means food, were on our parched and chapped lips.

We knew we could pitch a camp here and that from it we could reconnoiter farther for a passage east through some cleft in the sheer rock cliffs which we had to put behind us if we wanted to succeed.

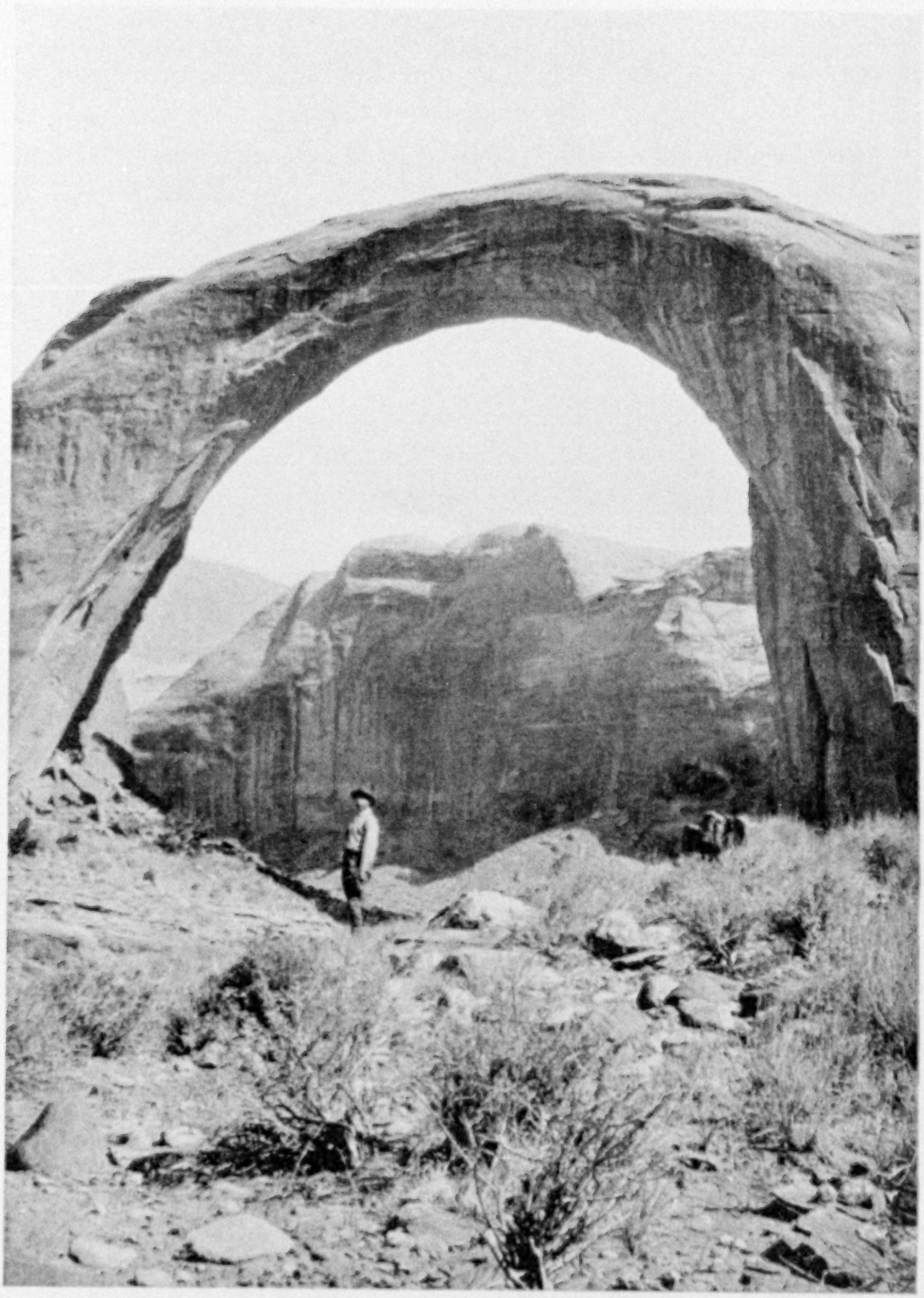
DRAWINGS IN COLOR LEFT BY THE BASKET-MAKERS

Next morning we shifted our camp a mile or so farther down Cliff Canyon into a small grove of cedars and piñons. We named it Painted Rock Camp because of drawings in three colors—red, yellow,



A POOL IN BRIDGE CANYON

Its waters teem with catfish, which probably worked up from the Big Colorado River.



LOOKING SOUTH AT RAINBOW NATURAL BRIDGE

Its arch is 274 feet wide and 308 feet high. In the distance looms Navajo Mountain.

A VIEW OF RAINBOW NATURAL BRIDGE FROM THE TOP OF THE CANYON WALL

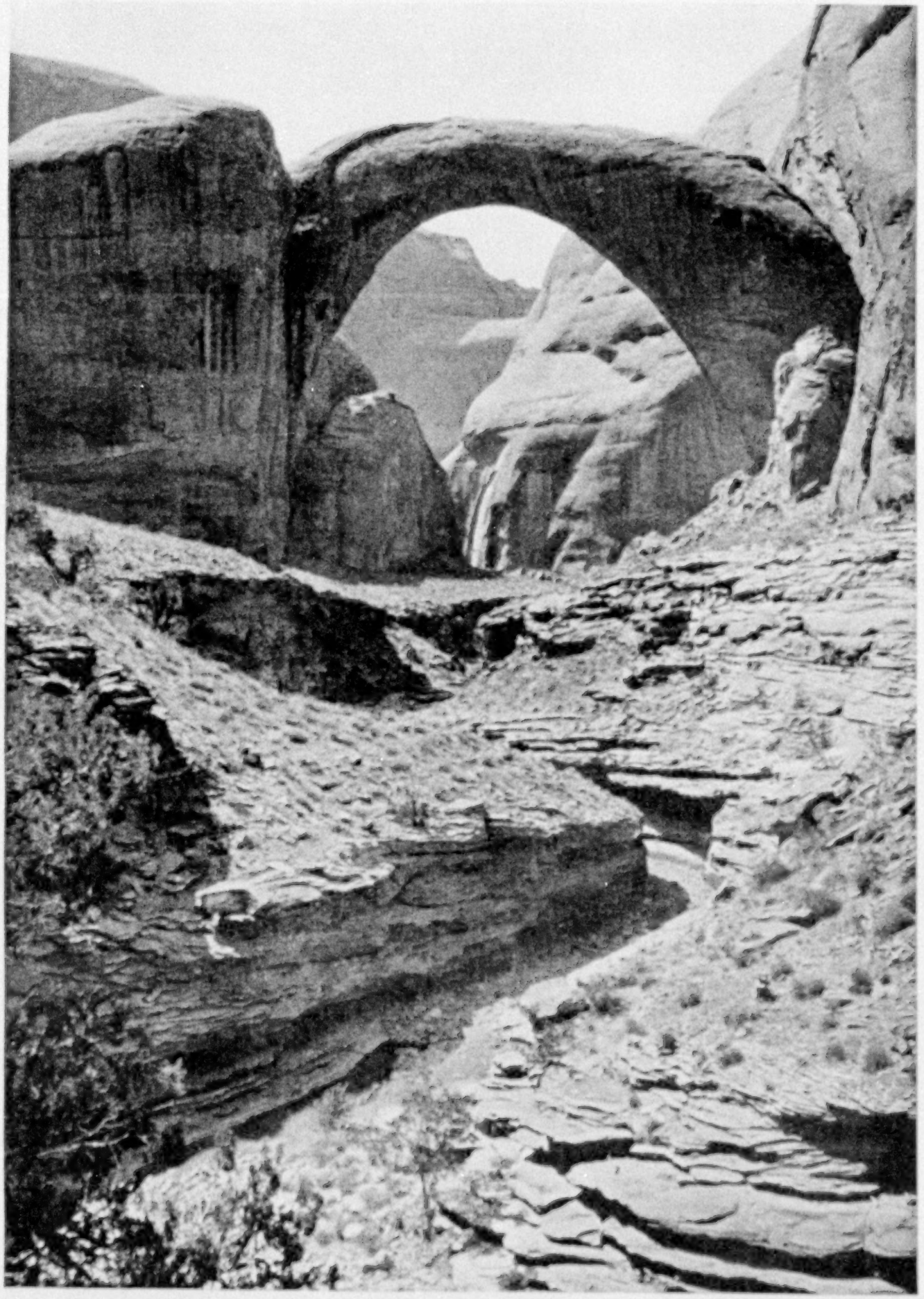
Note the tree standing at the right-hand pier of the arch and the distance between the rocks flanking it—nearly a quarter of a mile (see also page 218).

XUM

Photograph by Dr. George Dock

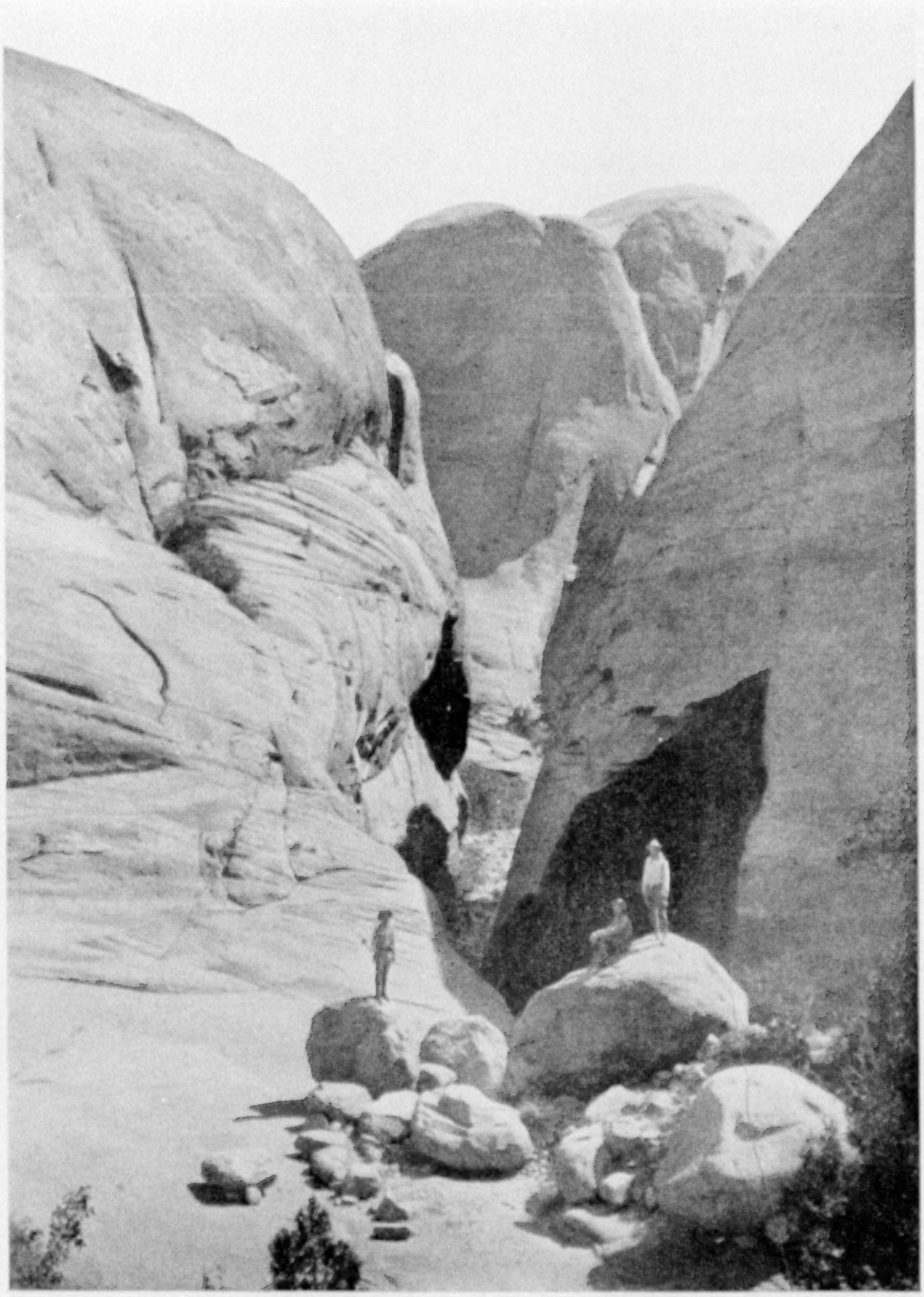
RAINBOW NATURAL BRIDGE FROM THE NORTH

Its arch partly spans a canyon which extends from Navajo Mountain northward toward the Colorado River.



RAINBOW NATURAL BRIDGE, LOOKING NORTH

The arch on the right seems imbedded in the rocks, whereas it stands entirely free, as shown in the illustration on the opposite page. The distance between the two rock masses on the right, one this side of the arch and the other beyond, is nearly a quarter of a mile (see page 216).



NASJA CANYON, NORTH OF SURPRISE VALLEY

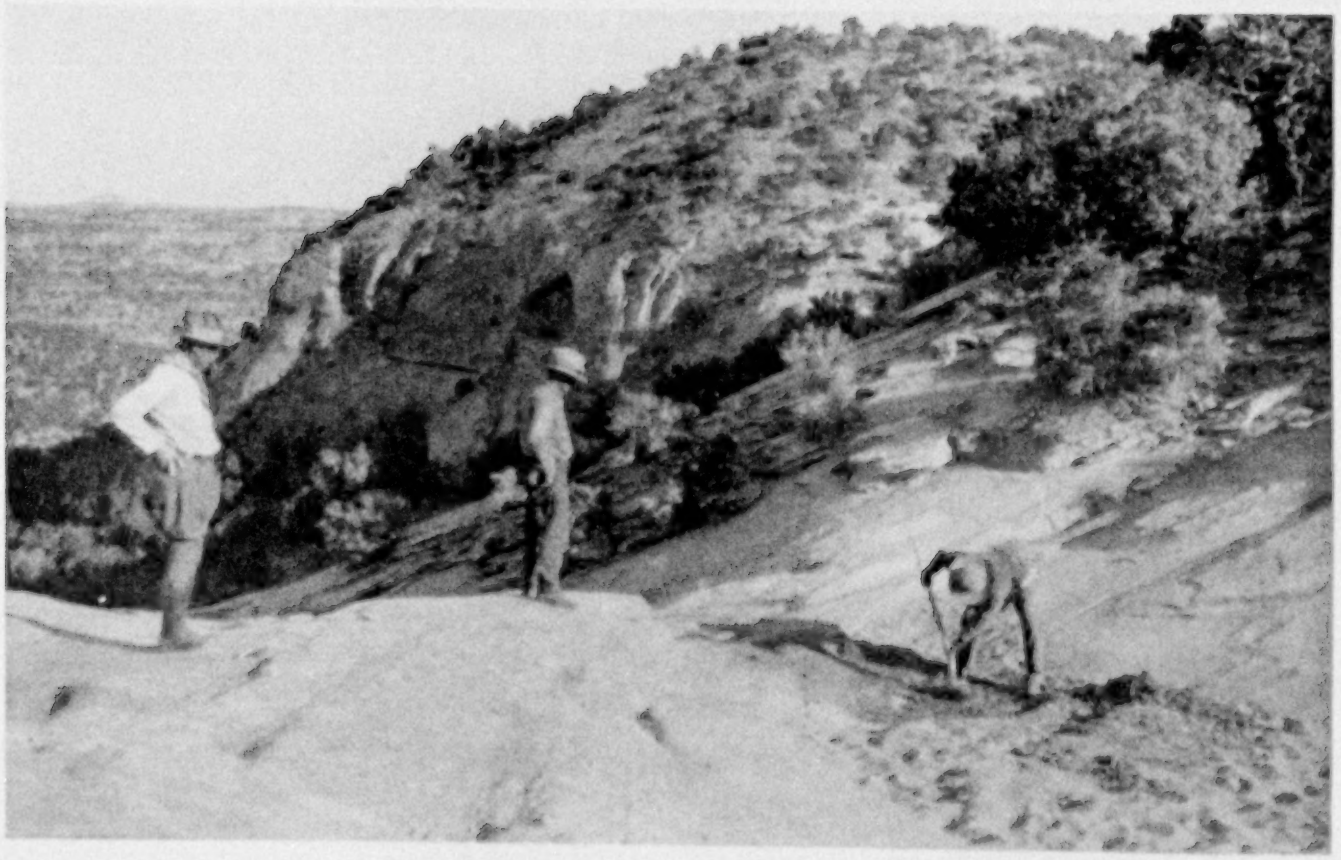
This canyon, emptying into the San Juan River many miles to the north, had never been penetrated beyond three or four miles of its boulder-strewn bed. Not far from here the party was stopped by rock walls, for the waters had found a subterranean passage.

ON THE TRAIL EAST OF BEAVER CREEK

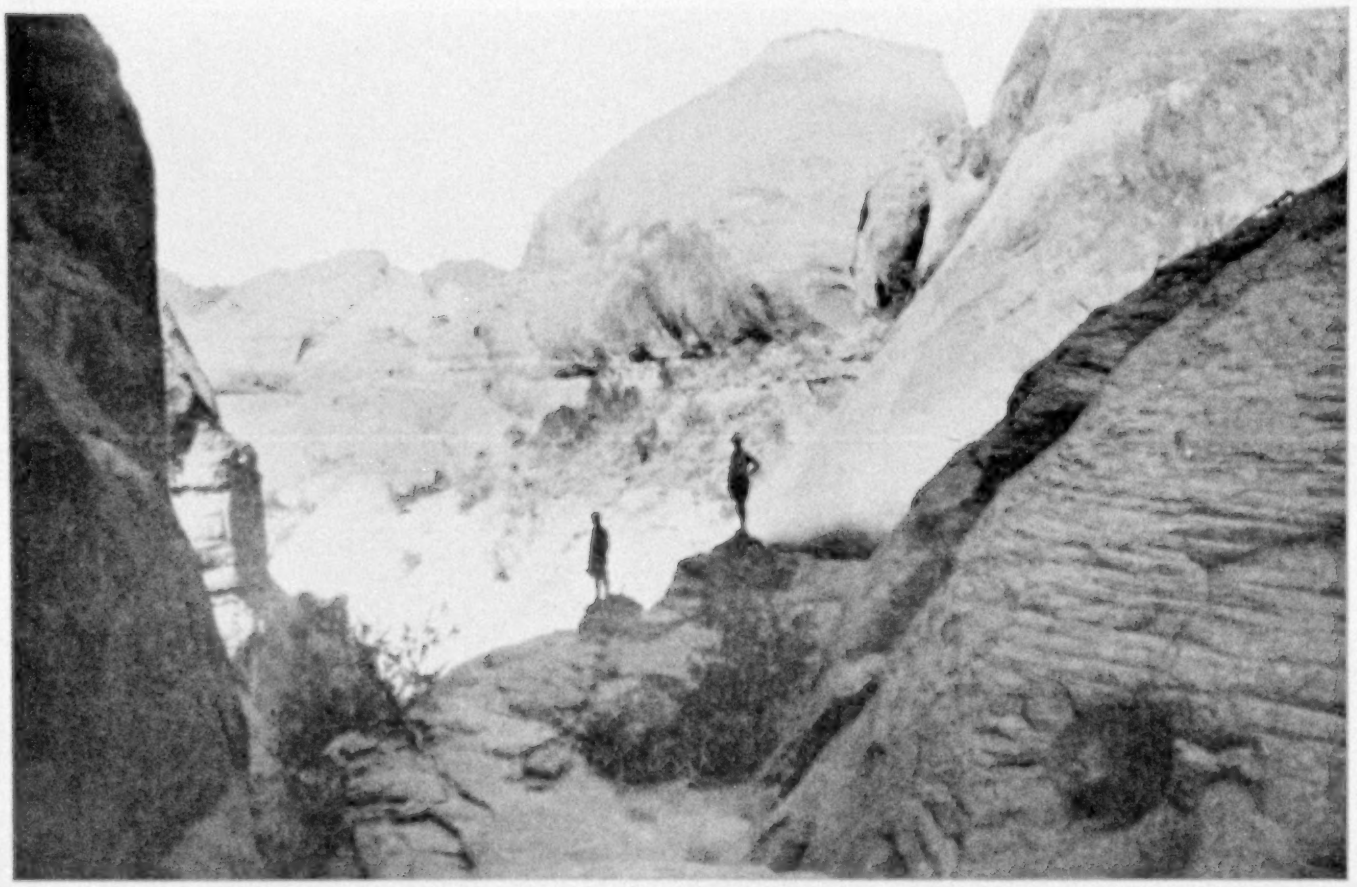
GRAZING IN SURPRISE VALLEY, NASJA CREEK

Note the wooden stirrups, which are most restful when one is eight or ten hours in the saddle.

A WELCOME WATERPOOL BETWEEN PIUTE AND NAVAJO CANYONS



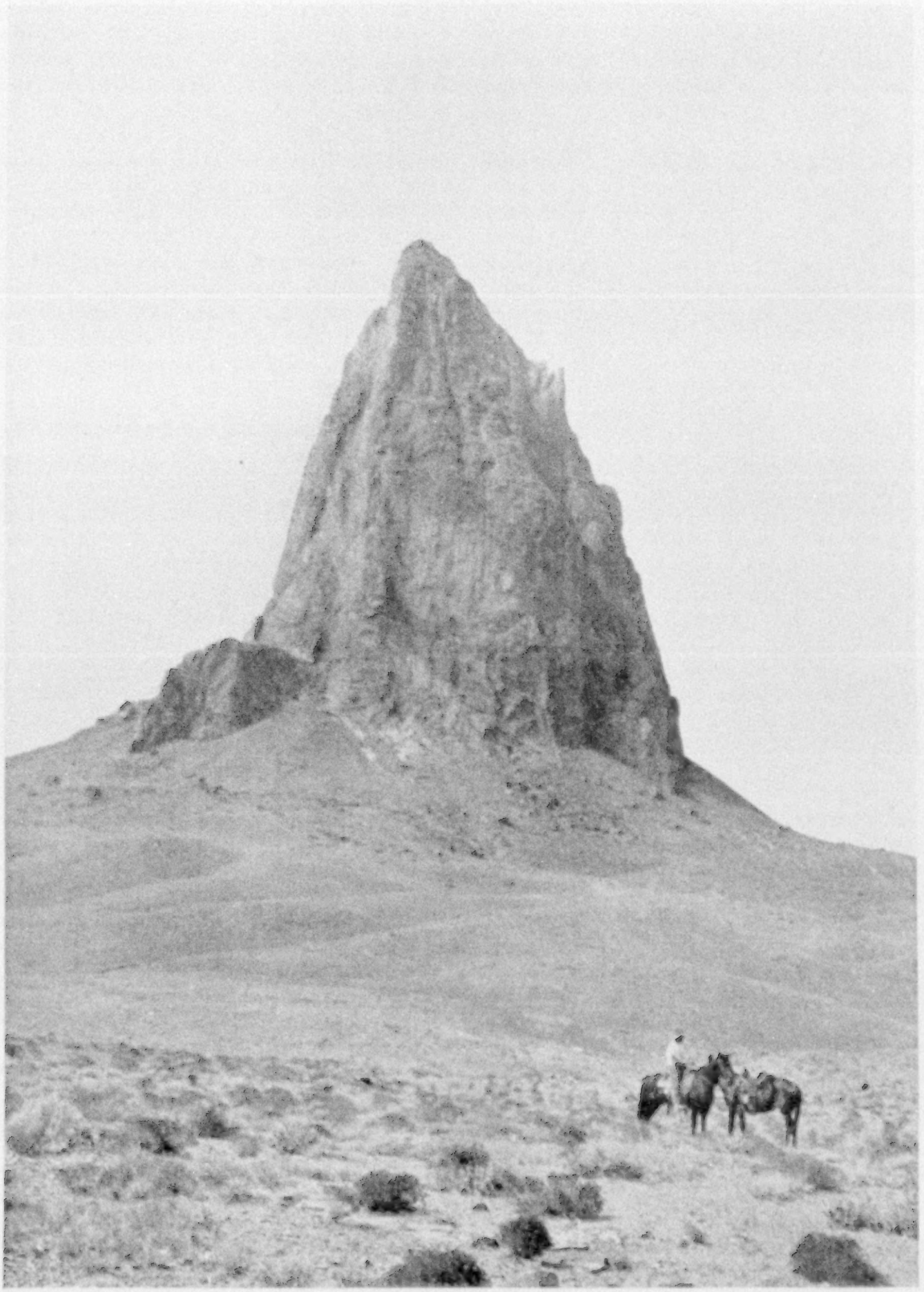
DIGGING FOR WATER AT ROUGH TRAIL CAMP
Note the easterly slope of Piute Canyon in the distance.



STANDING ON THE DIVIDE BETWEEN THE CLIFF CANYON AND BRIDGE CANYON SYSTEMS

A THIRSTY PACK-TRAIN IN ZANE GREY CAVE

This is the beginning of Zane Grey Canyon, named in honor of the author by the Bernheimer Expedition. This canyon enters Piute Canyon, to the east. The cave was practically dry, but upon digging a trench eight feet deep and ten feet long, sufficient water was obtained for the animals.



Photograph by Dr. George Dock

AGATHLA NEEDLE, NORTHERN ARIZONA, 1,225 FEET ABOVE THE LEVEL OF THE DESERT

This majestic pinnacle rises to the north of Kayenta and is a giant's sign-post directing the tourist back to civilization.

and black—on the rock face near by, above a cliff-ruin site. The type of drawings indicated that it was the former home of basket-maker aborigines, who, by the way, belonged to an era preceding the pottery-makers.

Here we had splendid water for drinking, rock pools for bathing, and our animals had very fair grazing—an important element in our calculations, for we were sorely in need of the feed of the wayside to conserve our 1,500 pounds of oats, which we brought from Kayenta, where we did our outfitting (see map, page 198).

On June 30 we commenced reconnoitering to the east. The most hardy of our little band went to find an opening through the easterly cliffs, while Johnson and I went downstream to ascertain where it would lead and to verify our suspicion that our Cliff Canyon Brook emptied into Forbidding Canyon.

Our suspicions were well founded. Two miles downstream we reached the notorious Forbidding Canyon, which promptly exhibited all its characteristics, so well known to us (see text, page 198). Its course soon became impassable for animals and a bit farther almost so for man, unless provided with rope.

A SKELETON FOUND IN CHARCOAL CAVE

At a cave, which we named Charcoal Cave because of its many fireplaces, we turned back, after digging for remains in the refuse piles. In these piles we only found wooden implements and sandals made of yucca fiber, but on another visit Mr. Morris dug up the complete skeleton of a boy.

Alongside of the skeleton, Mr. Morris found 499 beads of hematite iron, the loosened parts of a necklace, and five arrows and lance-heads fashioned of petrified wood. This cave, which measured about 400 feet in width by 250 feet in depth, seems a promising field for the remains of the basket-makers.

In the meantime, two days' search on the part of our other men resulted in the discovery of a very likely opening in the easterly canyon wall, and we resolved to dig or blast our way through this. It was necessary for us to take this course, as there was no other way out. Our supply of dynamite, T. N. T., and black powder we hoped would be sufficient.

This meant that, besides trail-making, it would be necessary for us to widen the cleft in two places to allow our animals to squeeze through. That, however, was the lesser of the problems ahead of us. The major operation was the blasting of one of the three vertical adjoining colossal rock masses and filling in the forty-foot hole beyond, in order to allow safe passage to our loaded animals.

For nine days we were camped at Painted Rock, two miles distant. Six days were consumed in making a trail over a distance of one mile, four of which were taken up in blasting a way through some 400 feet.

REDBUD PASS LEADS TO SUCCESS

July 9 was a red-letter day. Our trail, which was made with so much care, was finally finished and all of us rode over it. We named it Redbud Pass because we there discovered large numbers of redbud trees, whose strong and tough wood supplied us with material for crowbars. We reached Bridge Canyon and the Rainbow Natural Bridge without the necessity of dismounting and dragging our animals after us.

The feat was accomplished and it only remained for us to get our outfit through. This we did three days later, thus locating the "Northwest Passage," as I often referred to it, and completing the "circumnavigation" of Navajo Mountain.

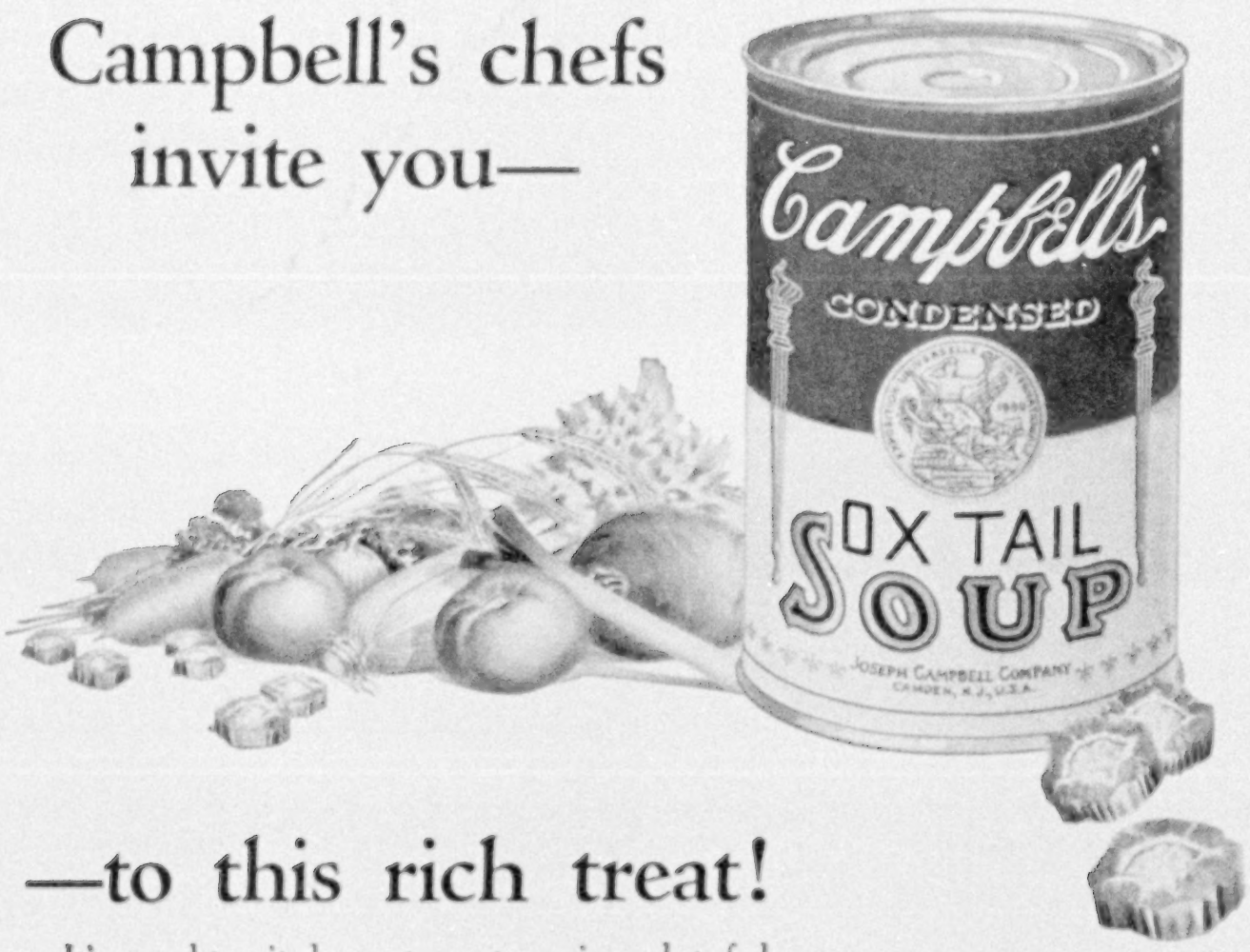
To attempt to refer to the many other incidents in our Rough Rider journey or to elaborate details—amusing, daring, scientific, or mundane—would lead too far. Mere reference to the perilous ascent of No Name Mesa by some of our men, not including myself, excursions in Forbidding Canyon, and explorations in Nasja and Beaver canyons, must also suffice.

The circling of Navajo Mountain, an intimate contact with hundreds of square miles of continental United States never before visited by white man, photographing and mapping the district, as well as the location of a great number of prehistoric sites and ruins, were the goals long visualized and ultimately achieved by the 1922 expedition.

Credit for this feat is due to the woodcraft of all of our men and the good generalship of our head guide, John Wetherill.

SOUP MAKES THE WHOLE MEAL TASTE BETTER

Campbell's chefs invite you—



—to this rich treat!

It's good to sit down to a steaming plateful of this smooth, hearty Ox Tail Soup. The very first spoonful tells you it has been made by chefs of highest skill. Tender sliced ox tail joints in a thick soup, in which are blended luscious tomatoes, plump barley, golden turnips, Chantenay carrots, choice celery, fresh parsley, a touch of leek, and tasty ox tail broth. Let it simmer a few minutes in the saucepan to bring out its full, delicious flavor. This is the strengthening, invigorating kind of soup that adds real nourishment to any meal. Enjoy Campbell's Ox Tail tonight!

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Just lift your steaming spoon!

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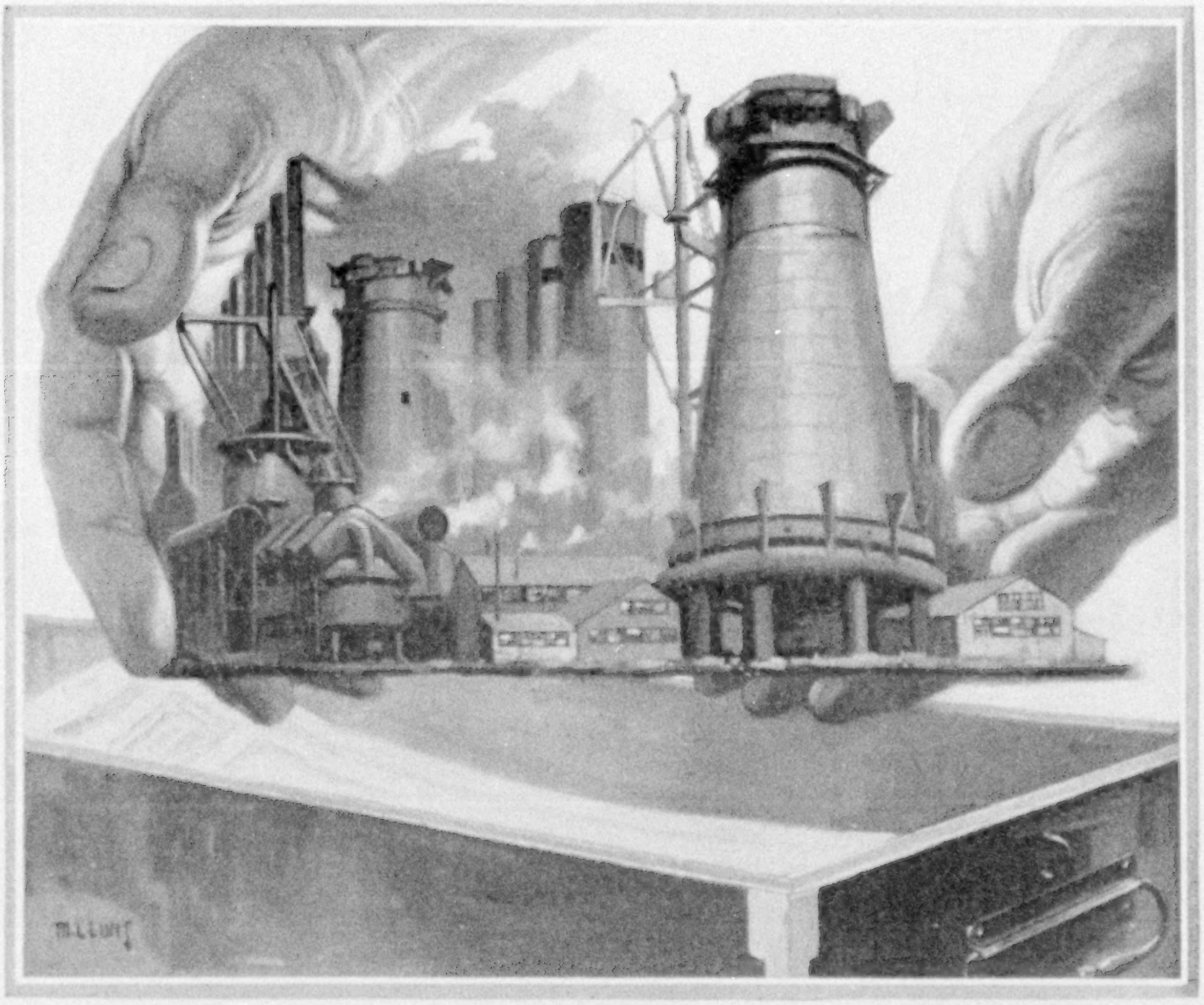

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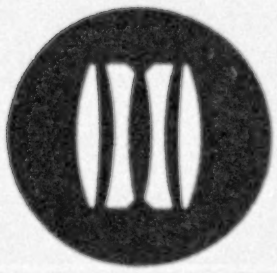

Photographing Five Miles

Kodak Lens Plant, where the Kodak Anastigmat is fashioned, has added another chapter to lens achievement in the successful manufacture of the largest lens known to aerial photography.

This lens, built for the United States Air Service and based on Kodak Anastigmat formulae, has a speed of *f*.5, a focal length of 36 inches and mounted is about half the size of a nail keg. It weighs about forty-five pounds.

Because of its extreme focal length and the sharp-cutting qualities which distinguish any product of the Kodak Lens Plant, this powerful lens makes satisfactory terrain photographs from a height of five miles, at which altitude the plane is virtually invisible from below.

To compare the Kodak Anastigmat *f*.7.7 Vest Pocket Kodak equipment with this giant lens is to realize the versatility and resources of the organization that produced both.

The KODAK ANASTIGMATS

f.7.7 *f*.6.3 and *f*.4.5

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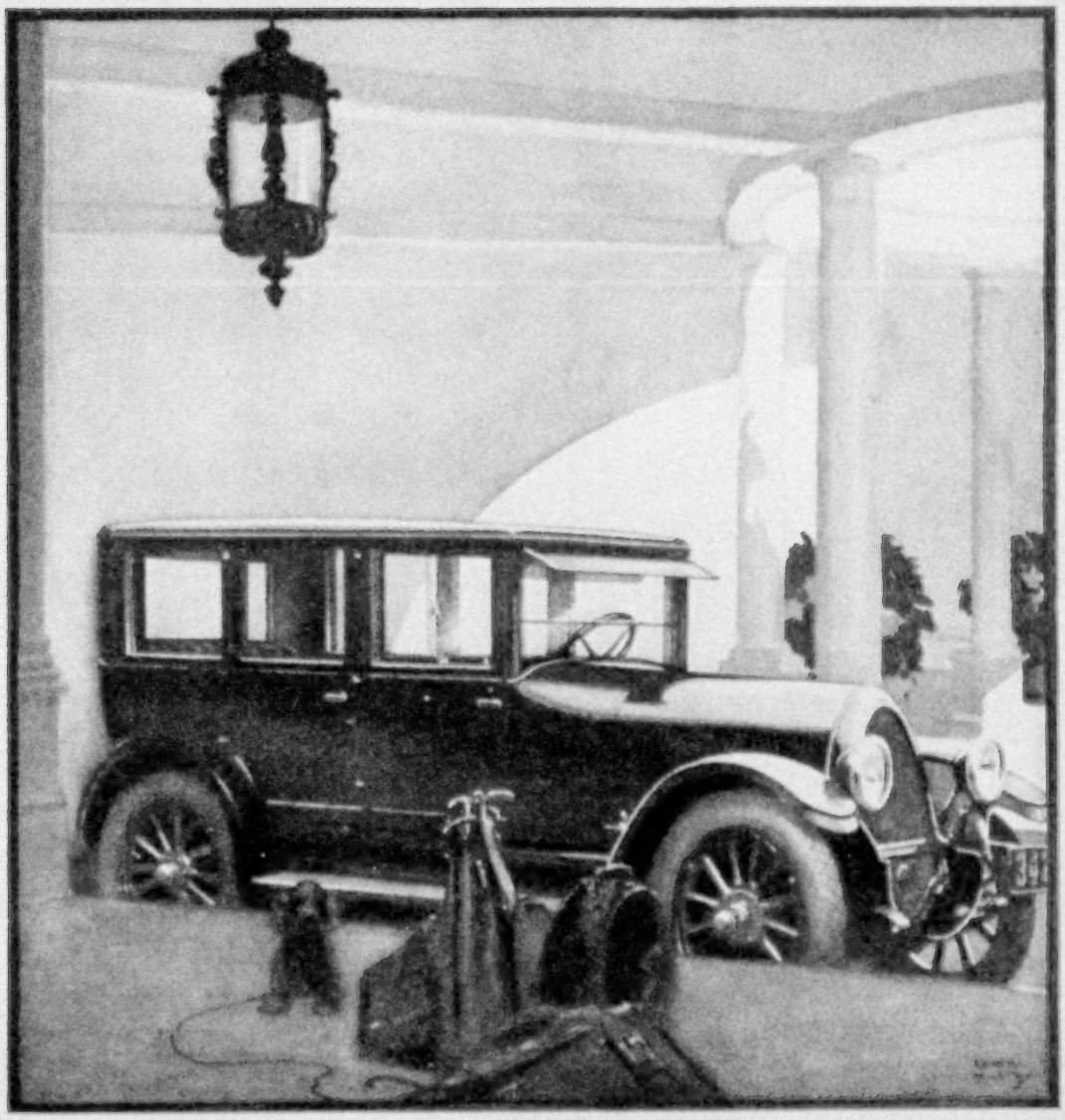

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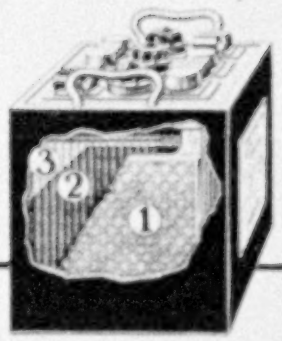

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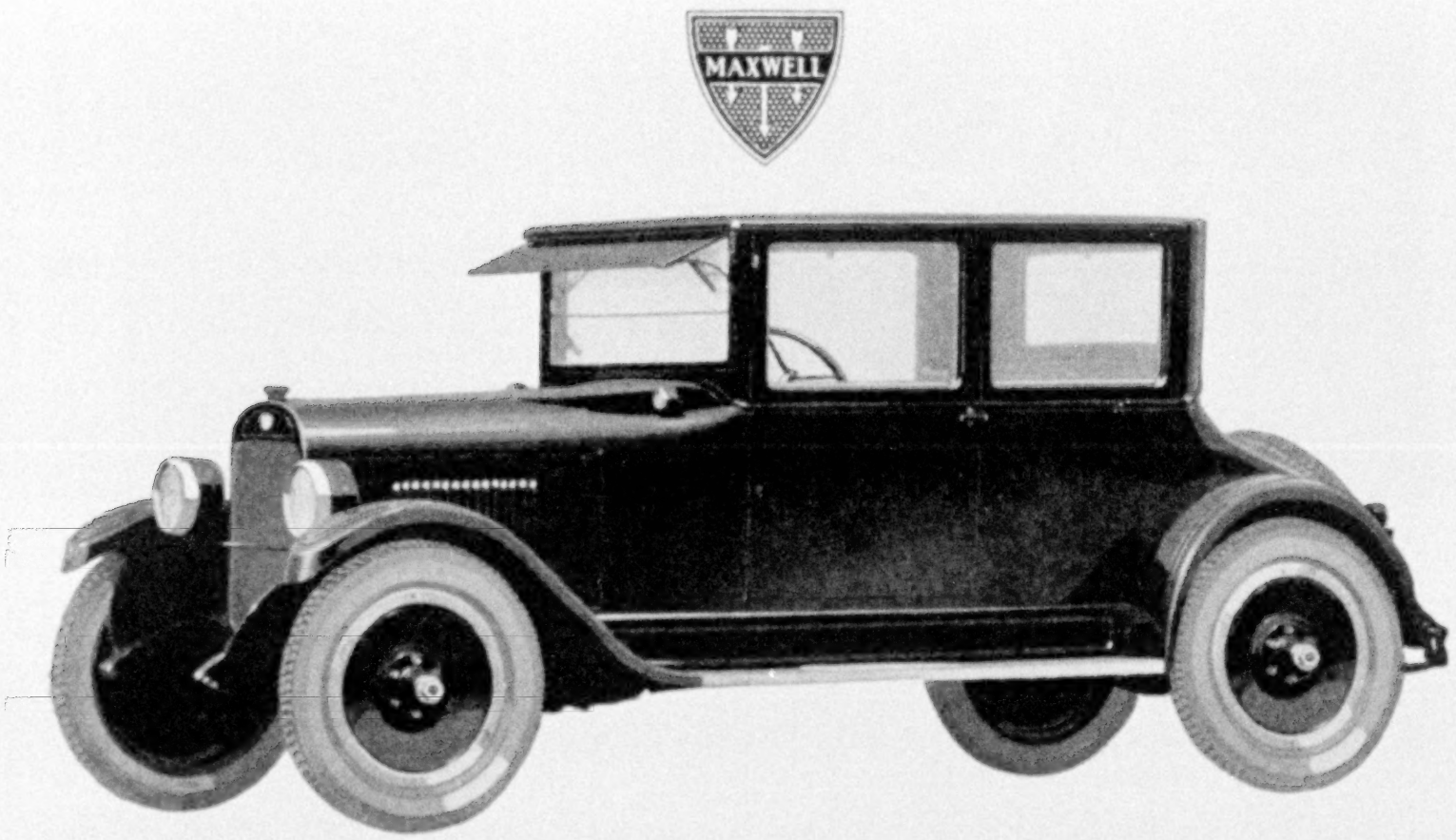

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Walter Camp, Yale's celebrated football coach, has been teaching men and women everywhere how to keep fit—"on edge"—full of bounding health and youthful vitality—and how to *enjoy* doing it. Walter Camp says that a civilized indoor man is a "captive animal," just as much as a tiger in a cage. But the *tiger* instinctively knows how to take the kind of exercise he needs to keep fit—he stretches, turns and twists his "trunk muscles"—the very same muscles that tend to become weak and flabby in indoor men and women. With Mr. Camp's permission the "Daily Dozen" exercises have now been set to spirited music on phonograph records. They supply exactly the right movements to put these vitally important "trunk muscles" into the pink of condition, and keep them there. These twelve remarkable exercises, done to music, with a voice on the record calling out the commands, are all you need to keep your whole body in splendid condition—and they take only 10 minutes a day.

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Simply mail the coupon and see for yourself, at our expense, the new, easy, pleasant way to keep fit. It will add years to your life and make you happier by keeping you in glowing health. Mail the coupon today. Address Health Builders, Inc., Dept. 792, Garden City, New York.

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KEEP the family together in the evenings—have them look for their pleasure at home. Many enjoyable hours can be spent with a

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This Balopticon, of new design, is a high-grade, well-built projection machine, for the projection of opaque objects, such as photographs, post cards, or pages of books. It is attached to any ordinary lamp socket, and can be operated by anyone.

A favorite use among the children is in having pages of "bed-time stories," or similar books, with their clever pictures, thrown on the screen. The book is in no way damaged.

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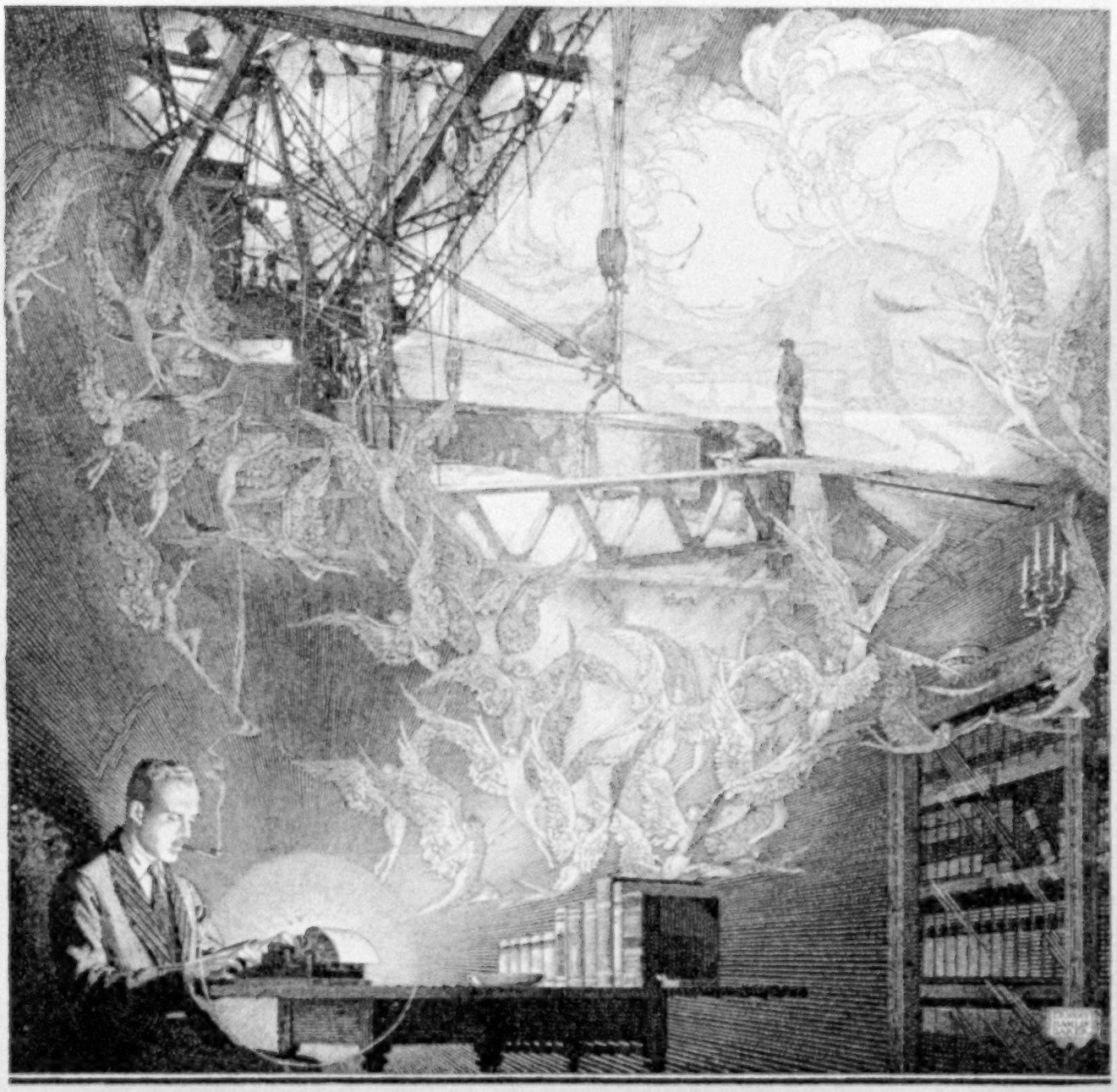

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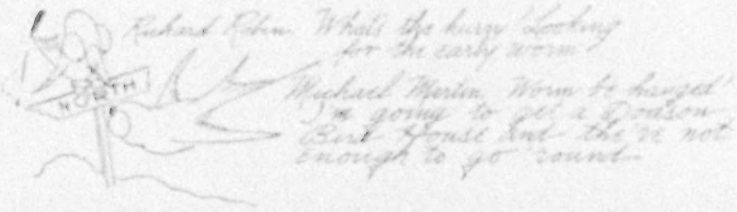
Richard Robin. What's the hurry? Looking for the early worm?
Michael Martin. Worm to himself! I'm going to get a Dodson Bird House. But there's not enough to go 'round.

Dodson **Bird Houses**

OVER THE VELVET OF YOUR LAWN THIS SEASON—among your trees—in your garden—welcome the song birds! . . Put up the Dodson Bird Houses. Quaint green and white signs of hospitality. Thereby will you escape those ravages of cut worms, grasshoppers, beetles. The song birds work merrily, protecting trees and gardens. The silver-toned wren who lives on six hundred caterpillars and bugs a day—the busy martins with their appetite for mosquitoes—the flycatcher, blue bird, flicker—they all pay rent for the lodgings you offer! . . Now, good citizen, it is time to put up your houses. Beautiful estates, or the smallest places, know Dodson Bird Houses. Let Mr. Dodson advise you. Enjoy the blessings these scientifically-fashioned little houses bring you!

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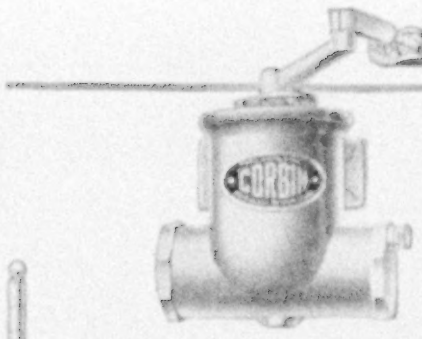

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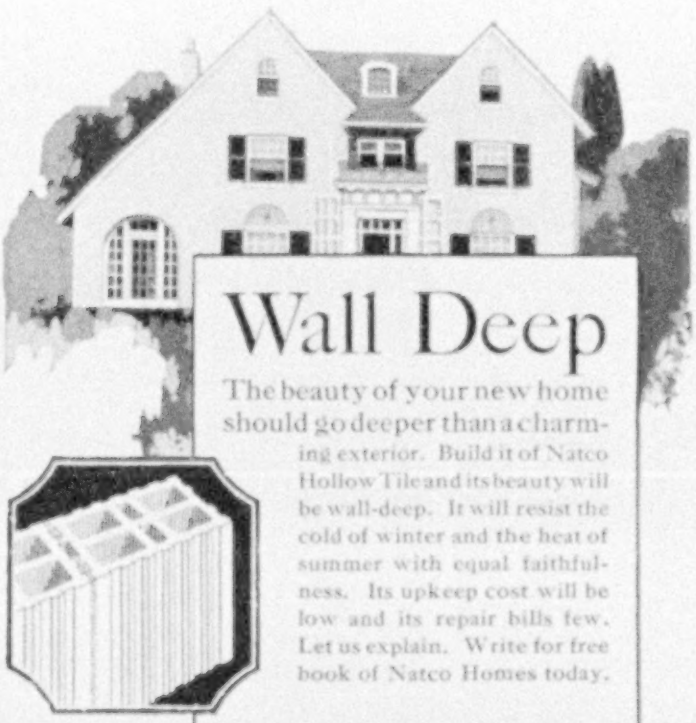

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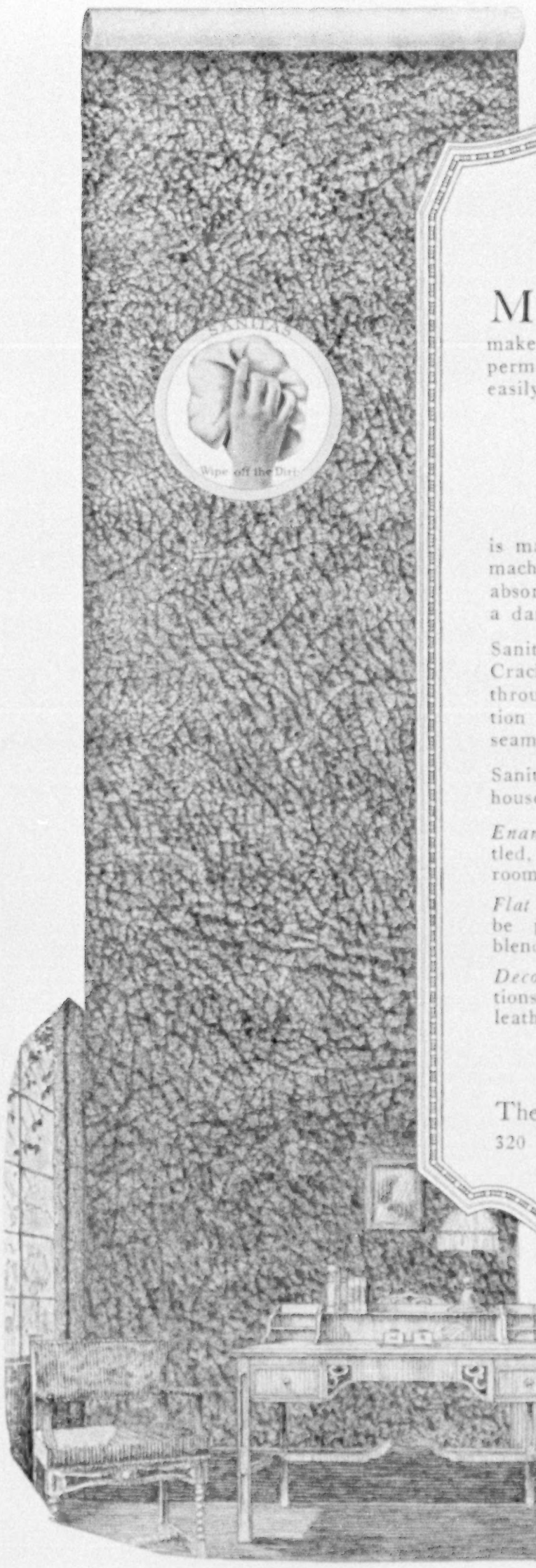

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is made on cloth; does not crack or tear. Its machine-painted surface does not fade, will not absorb grease or water, can be kept clean with a damp cloth.

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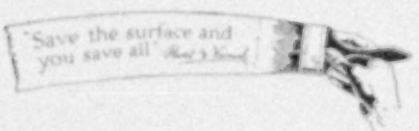

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Eng. Dept. A-3

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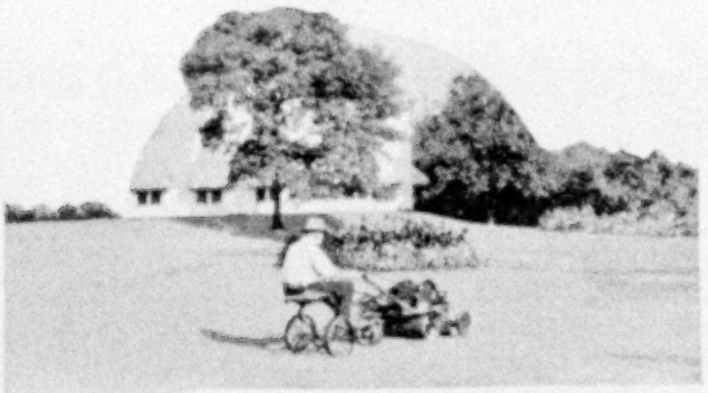

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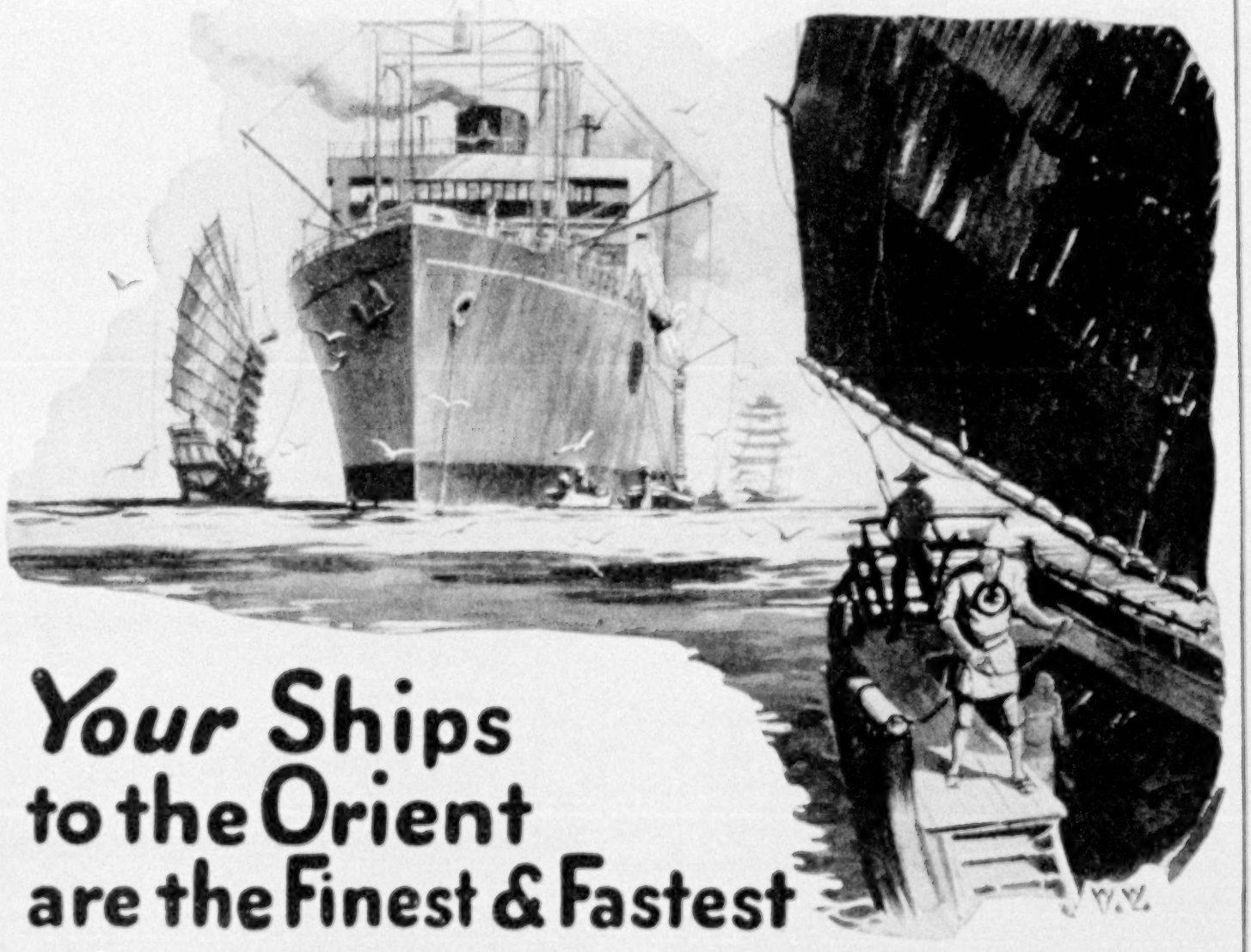

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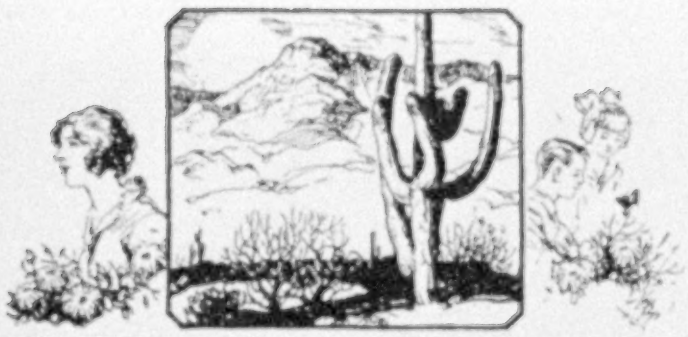

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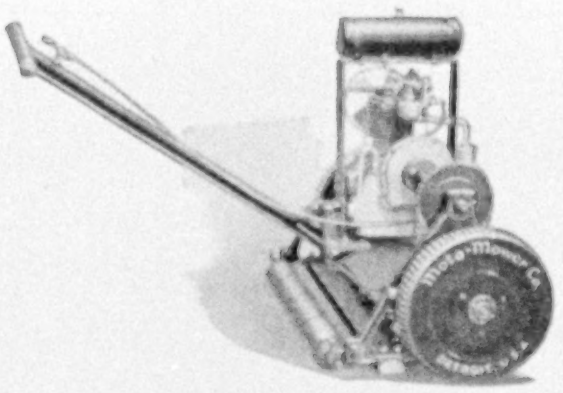

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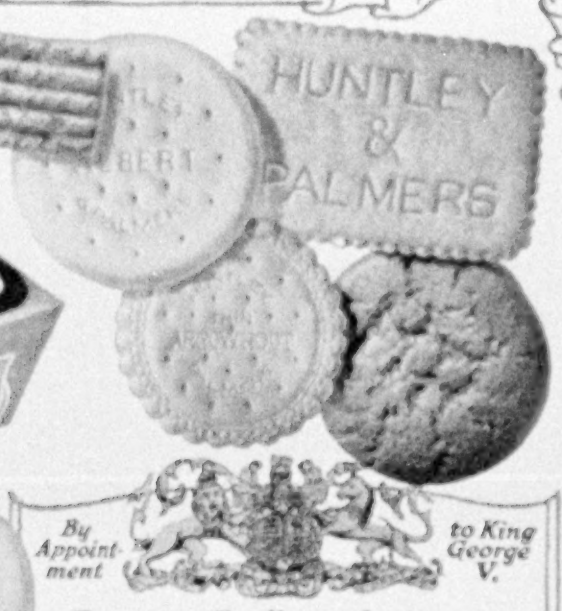

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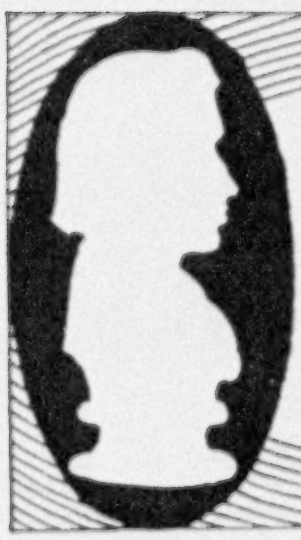

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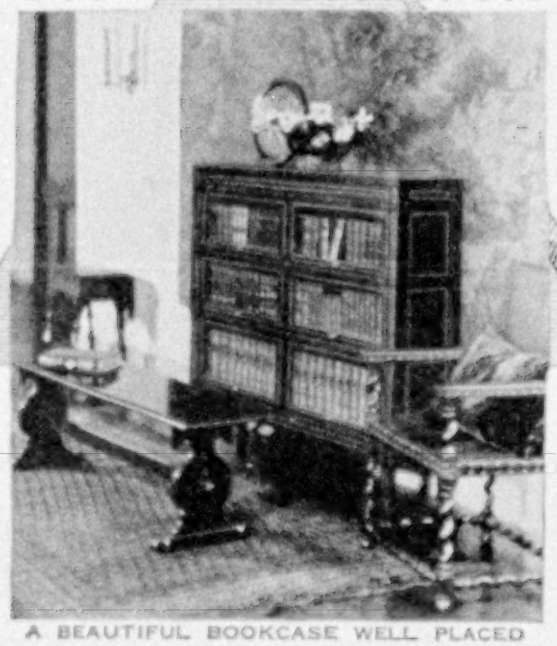

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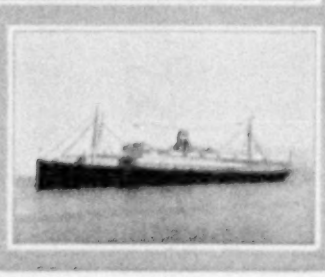

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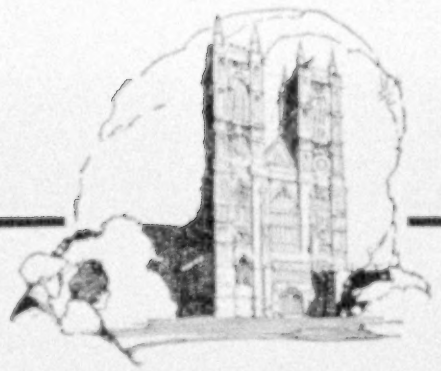

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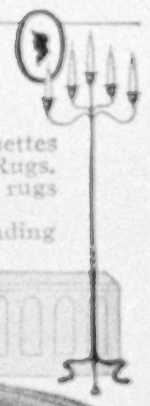

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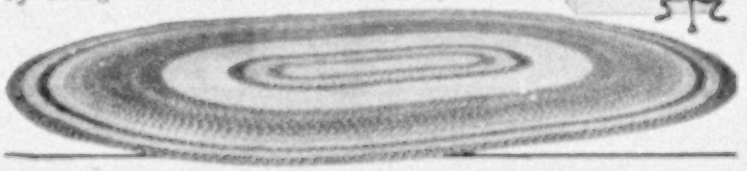

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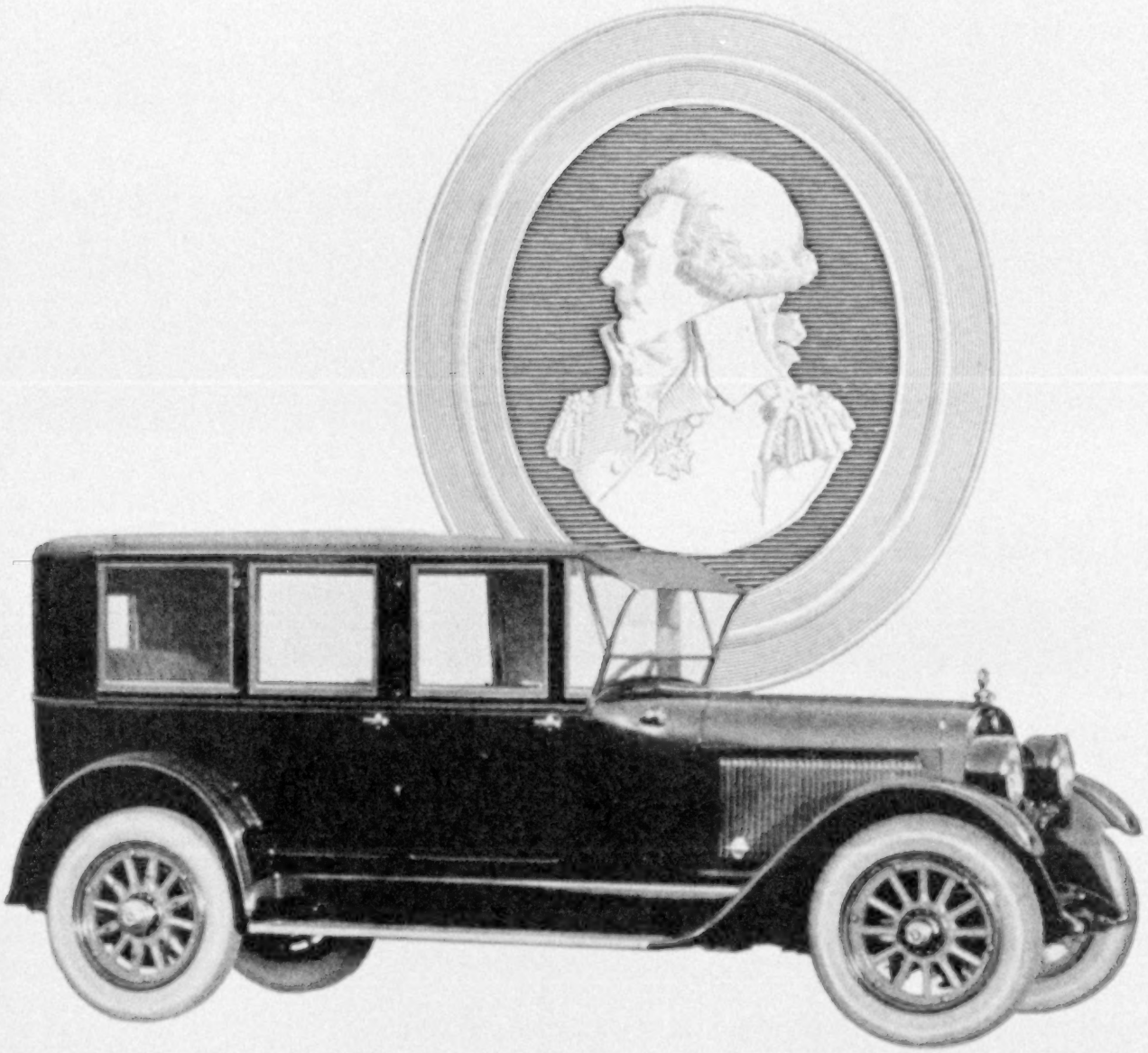

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LAFAYETTE

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Does a man notice his wife's hair?

PROBABLY few women realize how much their looks really matter to their husbands. A woman is apt to be deceived into thinking that he is no longer interested in her loveliness as he was during their courtship. But, make no mistake, there are two times at least when a man surely *does* notice his wife's hair—if it is beautiful or if some condition appears which will eventually destroy its beauty.

If you are troubled with dandruff, or if your hair is too dry, brittle and breaks off; or if it is oily, sticky and lifeless; take care. These conditions cause the hair to lose its attractiveness.

It is not enough just to cleanse the scalp of accumulated dust and other impurities. It must be stimulated as well. Science has never discovered anything better for this purpose than pine tar. Doctors recommend pine tar as a safe, gentle and effective tonic.

Packer's Tar Soap contains pine tar of the finest quality obtainable, and in addition is combined with just the right amounts of glycerine and vegetable oils. The scalp wakes up when this tonic and soothing soap is applied by the Packer Method. The millions of tiny cells and blood vessels carry their nourishing food to every part of the scalp. The scalp comes back to health, for a *well-nourished* scalp is always a *healthy* scalp.

IF YOU PREFER *a liquid shampoo, you will find Packer's Liquid Tar Soap (Packer's Shampoo) at most drug counters.* This *delicately perfumed Packer product has all the dependability that goes with the Packer name. Like the cake it will help you to keep your hair silky, soft and attractive.*

THE PACKER MANUFACTURING CO., INC.

Dept. 90-B 120 W. 32nd St., New York City

Canadian Wholesale Distributors: Lymans, Ltd., Montreal, The Lyman Bros. & Co., Ltd., Toronto

Shampoo with
PACKER'S

Special Sample Offer:

Send 25c for All Three Samples or 10c for any One of them

To introduce all three Packer products, this special offer—a generous sample of all three for 25c, Packer's Tar Soap, Packer's Shampoo, Packer's Charm (which quickly relieves chapped hands and lips and other rough conditions of the skin)—or send 10c for any one sample. At any time we gladly send free a copy of our Manual, "How to Care for the Hair and Scalp," giving detailed information prepared by an eminent skin specialist.

PRESS OF JUDD & DETWEILER, INC.
WASHINGTON, D. C.

The early savage removed grime by harsh scouring

Civilized people discover how to clean teeth without harsh scouring

"Wash"—Don't Scour Teeth
—Warns Modern Science

Your hands are soiled—do you clean them by scraping with sand alone? Savages used to do so. But civilization substituted soap. Then cleansing came more quickly, more thoroughly, and without *hurt*. As the early savage cleaned his hands, you today can take a gritty, soapless dentifrice and *scrape* clean the delicate enamel of your teeth. How much simpler—and safer—is the civilized method.

COLGATE'S CLEANS TEETH THE RIGHT WAY

"Washes" and Polishes—Doesn't Scratch or Scour

Children use Colgate's willingly and regularly because of its pleasing flavor. Colgate's cleans teeth thoroughly—no safe dentifrice does more. A LARGE tube costs 25c—why pay more?

AN OFFER

1—Buy a tube of Ribbon Dental Cream in its cardboard box.

2—Attach this coupon to the cardboard box. Slip both into an envelope and mail to Colgate & Co., Dept. 66, Box 645, City Hall Station, New York City.

3—We will then send you a generous sample of Colgate's Rapid Shave Cream.

Your Name_____

Address_____

CLEANS TEETH THE RIGHT WAY
"Washes" and Polishes
Doesn't Scratch or Scour

Truth in Advertising Implies Honesty in Manufacture